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ABSTRACT

This document contains two congressional hearings on the present apprenticeship programs to determine whether they are effective in producing the needed skilled craftspersons. The hearings also focus on how the apprenticeship training systems may be improved to meet the ever-changing needs of industry. Testimony includes statements, prepared statements, letters, and supplemental materials from United States representatives and individuals representing the National Tooling and Machining Association; National Association of Government Labor Officials; Metal Trades Department, AFL-CIO; Center for the Study of Human Resources, University of Texas at Austin; National Association of State and Territorial Apprenticeship Directors; Outreach Program, International Association of Bridge, Structural, and Ornamental Iron Workers; Goodyear Tire and Rubber Co.; Norfolk Shipbuilding and Drydock Corp.; National Joint Apprenticeship and Training Committee of the Electrical Contractors Association; Joint Apprenticeship Committee, AFL-CIO; National Education Committee, Associated Builders and Contractors; National Women's Law Center; American Vocational Association; departments of labor of various states; public school systems; the United States Department of Labor; and union locals. (YLB)

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# OVERSIGHT HEARINGS ON THE NATIONAL APPRENTICESHIP TRAINING ACT

## HEARINGS

BEFORE THE

SUBCOMMITTEE ON EMPLOYMENT OPPORTUNITIES

OF THE

COMMITTEE ON EDUCATION AND LABOR
HOUSE OF REPRESENTATIVES

NINETY-EIGHTH CONGRESS

FIRST SESSION

HEARINGS HELD IN WASHINGTON, D.C., ON
NOVEMBER 15, 17, 1983

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# OVERSIGHT HEARING ON THE NATIONAL APPRENTICESHIP TRAINING ACT

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TUESDAY, NOVEMBER 15, 1983

House of Representatives,
Subcommittee on Employment Opportunities,
Committee on Education and Labor,
*Washington, D.C.*

The subcommittee met at 9:35 a.m., pursuant to call, in room 2257, Rayburn House Office Building, Hon. Augustus F. Hawkins (chairman of the subcommittee) presiding.

Members present: Representatives Hawkins, Erlenborn, Gunderson, and Nielson.

Staff present: Susan Grayson McGuire, staff director; Teresita P. Schroeder, administrative assistant; Bradley Jefferies, legislative assistant; and Tom Royals, minority labor liaison.

Mr. Hawkins. The subcommittee will come to order.

Over the past two decades, the Federal Government has become increasingly more involved in job training and manpower development.

Through MDTA, CETA, and now JTPA, our Government has helped provide occupational skills to millions of American citizens.

It was because of our interest in providing employment opportunities to all Americans, our recognition of the importance of a trained work force to our country's well-being, and our belief that these programs would benefit our Nation in the future, that we became so deeply involved.

For these very same reasons, this subcommittee will begin reviewing the national apprenticeship program with today's hearing.

Since the passage of the National Apprenticeship Act in 1937, we have been engaged in protecting and promoting apprenticeship training in this country. This oldest and time-honored manpower development program has been providing our Nation with highly skilled craftsmen in a cost-efficient manner for over two centuries.

Combining on-the-job training with formal technical instruction, apprenticeship training has proven to be the most effective means of teaching a very complex skill to a motivated and dedicated student.

The national program has grown substantially since 1937, with the Federal Government, State governments, industry, labor, and the education and training community supporting apprenticeship programs in all 50 States and 3 territories.

In 1983, over 253,000 Americans were training in an apprenticeship program. Many industries rely on it as the sole means of training their skilled workers.

While the program has expanded in numbers, many other factors affecting apprenticeship training have changed. Our long-term economic outlook has transformed from one based on our unrivaled "smokestack" industries, to one based on an expanding service sector.

High technology and other emerging growth industries are beginning to dominate our economy. And as a result of fierce foreign competition, some firms find the cost of training to be prohibitive to their involvement.

It has been many years since we reviewed our national apprenticeship program. For the eighties and beyond, is apprenticeship still the best way to meet our skilled manpower requirements?

Is our national program the best way to approach this problem?

Should the Federal Government take a more active role?

My colleagues and I hope that this week's hearings will help us answer some of these and other questions about our national apprenticeship program.

The gentleman from Illinois, Mr. Erlenborn, has a statement

Mr. ERLENBORN. Thank you, Mr. Chairman.

Mr. Chairman, I commend you for calling these oversight hearings on apprenticeship programs. One of our mutual concerns is our Nation's unemployment and the lack of skilled workers to carry on the needed production in our defense and other major industries. Thus, it is most appropriate that we examine what has been a major training device used by industry.

These hearings are important also in light of a growing recognition of the need for a closer relationship between business and the education community if our citizens are to be educated so they can be employed by industry without having to be trained in the basic skills. They are important in light of recent studies criticizing our education system and reports of the problems facing apprenticeship programs.

For too long many of our major companies and a majority of our small businesses—under the press of daily business and the realities of the labor market—have continued to win their share of the Nation's skilled workers through wage bidding, not through the costly system of training. For some time, business has been going to the well for skilled workers without replenishing the source of supply.

Back in 1961, before I became a Member here, Congress conducted a preliminary review of the recruitment methods used in apprenticeship programs. This week's hearings are what might be called a new beginning to something old, but something that has been tried and found successful.

The concept of apprenticeship has served society well for generations. Craftsmanship was something that could not be learned from school books or lectures. The best way to learn a craft was by doing, under the tutelage of a master. And it took time—7 years was common. Apprentices did the hard, dirty work and put in long hours for paltry wages. As their skills developed, they would handle more complex tasks.

The road was long and hard, but the reward could be worth the struggle. Gaining recognition as a master craftsman put someone on a new level in society, and provided self-satisfaction for mastering a difficult art.

A review of our present national apprenticeship programs is really a study of the Nation's ability to train master craftsmen and skilled workers to meet the future industrial needs.

One of the main purposes of these hearings is to determine whether the present apprenticeship programs are effective in producing the needed skilled craftsmen.

I look forward to these hearings as an opportunity to better understand the various apprenticeship training systems and to focus on how they may be improved to meet the ever-changing needs of industry.

Thank you, Mr. Chairman.

Mr. HAWKINS. Thank you.

Mr. Nielson, do you have any comments?

Mr. NIELSON. No thank you, Mr. Chairman.

Mr. HAWKINS. Our first witness is Mr. Robert Glover, director of the Center for the Study of Human Resources at the University of Texas at Austin. Please proceed, Mr. Glover.

## STATEMENT OF ROBERT W. GLOVER, DIRECTOR, CENTER FOR THE STUDY OF HUMAN RESOURCES, UNIVERSITY OF TEXAS AT AUSTIN

Mr. GLOVER. Thank you, Mr. Chairman.

I am Robert Glover, director of the Center for the Study of Human Resources at the University of Texas at Austin.

I served as chairperson of the Federal Committee on Apprenticeship from June 1, 1978 until August 6, 1982, when I resigned to protest the disinterest, inactivity, and neglect which the Labor Department showed toward the work of the committee and toward apprenticeship generally.

Unfortunately, events over the past 15 months have only further confirmed the low priority accorded to apprenticeship by the present U.S. Department of Labor.

Although the Federal Committee on Apprenticeship has remained chartered, not a single meeting has been held since June 1982 and a new chairperson has yet to be appointed.

Virtually all funded apprenticeship activities have been eliminated. Indeed, we do not even know how many registered apprenticeships exist because the apprenticeship data system was eliminated in a budget cut in January 1980 and according to current plans, will not be restored until the end of fiscal year 1985.

The only response my letter of resignation received from the Labor Department was a statement by former Assistant Secretary Albert Angrisani to the Wall Street Journal which noted that "the apprenticeship program is a small piece of overall job training."

In fact, the numbers of apprentices are not insignificant. There are approximately 300,000 registered apprentices in this country, a number equal to about 30 percent of the total anticipated enrollment under the Job Training Partnership Act this year, I would like to note.

For these apprentices, the Labor Department will spend three-tenths of 1 percent of the total expenditures under JTPA.

Further, as I shall show you, apprenticeship is not widely used in the United States, but it is intensively used in certain industrial sectors where up to 70 percent of new journeymen craftworkers are trained through apprenticeship.

Although apprenticeship has had its problems under every administration, recent performance of the Labor Department is especially dismal. What differentiates the present Labor Department officials from their predecessors is that this administration questions that it has any proper role in apprenticeship and is thus abandoning the field under the pretext that it is a more appropriate area of activity for the States than for the Federal Government. Yet, 21 of the 50 States do not have a recognized apprenticeship State agency.

The Labor Department has shown no inclination to promote the formation of new State agencies or to otherwise encourage States to take on responsibilities for apprenticeship. Indeed, it even defunded all liaison discussions with existing State agencies. Apprenticeship training seems to have no value or priority to the present Labor Department.

Because they have measured their effectiveness by the size of their cutbacks, current Labor Department officials have virtually no positive record of achievement in apprenticeship they can point to for their 34 months in office. They have in effect neglected their responsibilities under the National Apprenticeship Act of 1937.

Since so much misunderstanding and myth prevails regarding apprenticeship, it is worthwhile to spend some time at the beginning of these hearings for reviewing the operation of apprenticeship in this country.

Apprenticeship is a voluntary industry-based training system involving a written contractual agreement between apprentices and their sponsors in which the sponsor promises to make available a broad and structured practical and theoretical training of an established length in a recognized occupational skill category.

Apprenticeship is a work-study scheme which provides a systematic program of on-the-job supervised training supplemented with related instruction, often provided in a classroom setting.

An apprenticeship program may be sponsored by a single employer, by a group of employers, by a single employer working jointly with a union, or by a group of employers working jointly with a union.

A persistent myth is that apprenticeship programs are union programs. In fact, 85 percent of the 50,704 apprenticeship programs registered in 1979 were unilaterally sponsored by employers—without union participation. Let me repeat that—85 percent. Not a single apprenticeship program is sponsored exclusively by a union.

Certainly, several unions have been strong supporters of apprenticeship but whenever they are involved as sponsors, unions work jointly with employers.

Often, the larger and more established programs are jointly sponsored by a group of employers and a union. Although these comprised only 8 percent of apprenticeship programs in 1979, they contained 54 percent of all active apprentices.

The reason that I am citing the 1979 statistics again are that they are the most recent that are available.

Apprenticeship is serious skilled training, best suited to jobs that require high levels of both mental and manual skills. Such work is most often found in craft or technical occupations. Apprenticeship is designed to take entry-level employees and train them through full journeymen craftworkers status.

Depending on the occupation, the length of training may range from 1 to 6 years, although the typical term ranges between 3 and 4 years.

All registered apprenticeship programs have provisions offering credit for prior training and work experience; many offer accelerated advancement to rapid learners; and some have revised their curriculum altogether from a time-based training format to a competency-based format.

Apprenticeship is designed to train for the industry rather than for an individual employer—and that is a very important point that is often overlooked—and completion of apprenticeship establishes skilled worker status and transferable qualifications.

A fundamental feature of apprenticeship is the broad training it offers in a wide range of skills in the craft. Apprenticeship proponents tend to view partial training programs the same way that lawyers would view a school that in a period of a few months trained individuals only to litigate divorces or that doctors would view a medical school to train people only to remove appendixes in a quick 1-year course.

In American apprenticeship, emphasis on broad training is in part a response to the realities of the construction labor markets where, as Dunlop and Mills have pointed out, in 1970, 6 million workers chased the equivalent of 3.2 million full-time jobs. Being partially trained in such a labor market can be a significant disadvantage to securing steady employment.

Apprenticeship is an attractive form of training because it provides earning while learning. Apprentices are regular employees and are paid a wage which progressively increases as their level of skill advances, according to a predetermined arrangement specified in the apprenticeship agreement.

Many apprenticeship programs have reputations for providing high-quality training that leads to high-paid skilled craft jobs with opportunity for advancement. Such training is sought after. Indeed, several well-established apprenticeship programs normally have as many as 10 or 20 applicants for each training position available.

You may be familiar with the item in the New York Times that comes out periodically about the 500 apprentices waiting in line for 5 days before local 3 of the Electricians takes applications for apprenticeship.

Given such popularity, apprenticeship sponsors can be quite selective in choosing apprentices. Most apprenticeship sponsors tend to view apprenticeship training as a major investment and, thus, choose apprentices who are "mature and settled down" and likely to stay with a firm or trade.

In manufacturing, apprenticeship slots are often reserved for existing employees and are allocated partly on the basis of seniority.

Also, many apprenticeship sponsors give preference to military veterans over other applicants.

As a consequence of these and other factors, the average age of a starting apprentice in the United States is in the midtwenties. In this regard, apprenticeship in the United States and Canada are unique. Everywhere else in the world, apprenticeship is a system for training teenage youth. Although existing U.S. apprenticeships often provide excellent training, they are not commonly available to high school students or even recent high school graduates.

Given the concern in this country over high rates of youth unemployment, you may be interested to know that the countries with the best developed apprenticeship systems in the world—West Germany, Switzerland, and Austria—also have among the lowest rates of youth unemployment in the world.

Apprenticeship today faces many problems. Almost all of the important persistent issues can be classified into five key areas of concern, namely: No. 1, expanding and extending the use of apprenticeship into occuptions for which it is appropriate, especially in occupations of national skill shortage; No. 2, maintaining and improving the quality and cost effectiveness of training offered through apprenticeship; No 3, achieving effective equality of opportunity in apprenticeship, especially for women, minority men, and handicapped individuals; No. 4, clarifying the appropriate role of government in apprenticeship, then deciding which is the Federal role and which is the States' role; No. 5, improving the relationship between apprenticeship and other training institutions such as especially the vocational education system, the Job Training Partnership Act training programs, military training, training in colleges and universities, vocational rehabilitation, and the veterans educational benefit program.

Each of these five areas has been at issue in apprenticeship for decades. And each will continue to be significant to apprenticeship in the future.

I might note that when I became chairman, I read the minutes of several past meetings of the Federal Committee on Apprenticeship, and the meetings go back to 1934, and it is incredible to me how recurrent these issues are over the years—literally, these are issues that were debated in the thirties and forties, and they are still issues in apprenticeship now.

Most discussions of the significant issues facing apprenticeship put the need for expansion at the top of the list. As many observers have pointed out, the quantity and quality of apprenticeship training has widespread impact on the American economy. Training of skilled workers in apprenticeable occupations affects the Nation's position in international competition; our Nation's military preparedness, especially the mobilization of defense-related manufacturing; the price and quality of goods and services obtained by consumers; backlogs in delivery schedules; and our Nation's ability to take advantage of advances in technology or shifts in product markets on a quick-response basis.

Advocates of apprenticeship point out that apprenticeship has a documented record of performance as an effective training system and they decry the fact that it is not more widely used. Also, I could provide some documentation about the effectiveness of apprenticeship if the committee would like.

Apprenticeship is certainly not widely used. More than half of the 738 occupations deemed apprenticeable by the Bureau of Apprenticeship and Training do not have more than 10 active apprentices nationwide. Indeed, as of December 1978, there were 149 apprenticeable occupations without a single apprentice nationwide.

But there is another side to this picture. The use of apprentices is concentrated within a few occupations and industries where it has flourished. Three out of four apprentices work either in construction, especially in the unionized building trades or in manufacturing, especially for larger firms. Both in unionized construction and in large-scale manufacturing, the vitality of apprenticeship is due to exceptional circumstances.

In large-scale manufacturing, there has been an unusually high level of attachment between worker and firm, permitting the firm to invest significantly in training with little risk of losing the investment. Yet, relatively few employers in the United States are blessed with the low turnover rates among skilled workers that major manufacturers enjoy.

Unlike large-scale manufacturing, construction employers cannot avoid high rates of employee turnover since their industry is so sensitive to cyclical and seasonal change. Indeed, given the extremely high volatility of construction employment, it is impressive that the industry has been able to sustain any significant long-term skill training.

Yet, construction employers, with the encouragement and support of building trade unions, have been able to develop institutions that allow them to offer high quality training in an environment of high employee turnover; namely, the multi-employer sponsorship of training and the industry training trust fund.

After several years of studying apprenticeship, I have come to realize the great importance of these two institutions. These institutions together, with considerable dedication and effort on the part of the industry's leaders, have allowed construction to build some of the best training programs in the country. Indeed, the best training programs in the world.

If this committee is interested in how apprenticeship can be improved and expanded in the future, it should closely examine this excellent training now offered in certain manufacturing firms and in the building trades, especially using the multi-employer sponsorship idea and the industry training trust fund concept.

From my experience with the Federal Committee on Apprenticeship, I am convinced that the problems facing apprenticeship are not insurmountable. They can be met through a process of dialog between all of the parties involved.

In arranging this oversight hearing, you have sparked a renewed discussion of apprenticeship. At very little public expense, and with the active, and I emphasize active, interest on the part of the Labor Department, the dialog can be continued, the problems overcome, and the promise and potential apprenticeship holds can be realized.

Thank you.

[The prepared statement of Robert W. Glover follows:]

## PREPARED STATEMENT OF ROBERT W. GLOVER, DIRECTOR, CENTER FOR THE STUDY OF HUMAN RESOURCES, UNIVERSITY OF TEXAS AT AUSTIN

I am Robert Glover, director of the Center for the Study of Human Resources at the University of Texas at Austin. I served as chairperson of the Federal Committee on Apprenticeship from June 1, 1978 until August 6, 1982 when I resigned to protest the disinterest, inactivity and neglect which the Labor Department showed toward the work of the committee and toward apprenticeship generally.

Unfortunately, events over the past 15 months have only further confirmed the low priority accorded to apprenticeship by the present U.S. Department of Labor. Although the Federal Committee on Apprenticeship has remained chartered, not a single meeting has been held since June 1982 and a new chairperson has yet to be appointed. Virtually all funded apprenticeship activities have been eliminated. Indeed, we do not even know how many registered apprenticeships exist because the apprenticeship data system was eliminated in a budget cut in January 1980 and according to current plans, will not be restored until the end of fiscal year 1985.

The only response my letter of resignation received from the Labor Department was a statement by former Assistant Secretary Albert Angrisani to the Wall Street Journal (August 31, 1982, p. 1) which noted that "the apprenticeship program is a small piece of overall job training."

In fact, the numbers of apprentices are not insignificant. There are approximately 300,000 registered apprentices in the country, a number equal to about 30 percent of the total anticipated training enrollment under JTPA this year. For these apprentices, the Labor Department will spend three tenths of one percent of total expenditures under JTPA.[1] Further, as we shall see, although apprenticeship is not widely used in the U.S., it is intensively used in certain industrial sectors where up to 70 percent of all new journeymen craftworkers are trained through apprenticeship.

Although apprenticeship has had its problems under every administration, recent performance of the Labor Department is especially dismal. What differentiates present Labor Department officials from their predecessors is that this administration questions that it has any proper role in apprenticeship and thus is abandoning the field under the pretext that it is a more appropriate area of activity for the states than for the federal government. Yet twenty of the 50 states do not have a state apprenticeship agency. And the Labor Department has shown no inclination to promote the formation of new state agencies or to otherwise encourage states to take on responsibilities for apprenticeship. Indeed it even defunded all liaison discussions with existing state agencies. Apprenticeship training seems to have no value or priority to the present Labor Department officials.

Because they have measured their effectiveness by the size of their cut backs, current Labor Department officials have virtually no record of positive achievement in apprenticeship they can point to for their 34 months in office. They have in effect abandoned their responsibilities in the apprenticeship area.

Since so much misunderstanding and myth prevails regarding apprenticeship, it is worthwhile to spend some time at the beginning of these hearings reviewing the operation of apprenticeship in America.

What is apprenticeship?

Apprenticeship is a voluntary industry-based training system involving a written contractual employment agreement between apprentices and their sponsors in which the sponsor promises to make available a broad and structured practical and theoretical training of an established length in a recognized occupational skill category. Apprenticeship is a work-study scheme which provides a systematic program of on-the-job supervised training supplemented with related instruction, often provided in a classroom setting.

An apprenticeship program may be sponsored by a single employer, by a group of employers, by a single employer working jointly with a union or by a group of employers working jointly with a union. A persistent myth is that apprenticeship programs are union programs. In fact, 85 percent of the 50,704 apprenticeship programs registered in 1979 were unilaterally sponsored by employers—without union participation. Not a single apprenticeship program is sponsored exclusively by a union. Certainly, several unions have been strong supporters of apprenticeship but whenever they are involved as sponsors, unions work jointly with employers. Often, the larger and more established programs are jointly sponsored by a group of employers and a union. Although these comprised only 8 percent of apprenticeship programs in 1979, they contained 54 percent of all active apprentices.

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[1] It should be noted that, unlike trainees in JTPA programs, the majority of apprentices are not economically disadvantaged. Nevertheless, compared with the number of individuals served by JTPA (which occupies major attention in the Department of Labor), the number of apprentices is significant.

Apprenticeship programs meeting certain minimum standards may be registered with the Bureau of Apprenticeship and Training in the U.S. Department of Labor or with one of thirty-two apprenticeship agencies in the states and territories. The standards aim to assure quality, standardized training, the use of a written apprenticeship agreement, a progressively increasing wage scale, reasonable use of probationary periods, appropriate credit for prior work experience and training, journeyman/apprenticeship ratios suitable for training, nondiscrimination, adequate recordkeeping, recognition of completion and the like. Apprentices who graduate from registered apprenticeship programs are issued a certificate of completion by the registration agency.

Apprenticeship is *serious skill training*, best suited to jobs which require high levels of both mental and manual skills. Such work is most often found in craft or technical occupations. Apprenticeship is designed to take entry-level employees and train them through full journeymen craftworkers status. Depending on the occupation, the length of training may range from one to six years, although the typical term runs three to four years. All registered apprenticeship programs have provisions offering credit for prior training and work experience: many offer accelerated advancement to rapid learners; and some have revised their curriculum altogether from a time-based training format to a competancy-based format. Apprenticeship is designed to train for the industry rather than for an individual employer and completion of apprenticeship establishes skilled worker status and transferable qualifications.

A fundamental feature of apprenticeship is the broad training it offers in all facets of the craft. Apprenticeship proponents tend to view "partial training programs" the same way that lawyers would view a school that in a period of a few months trained individuals only to litigate divorces or that doctors would view a medical school that trained people only to remove appendices in a quick one-year course. In American apprenticeship, emphasis on broad training is in part a response to the realities of construction labor markets where, as Dunlop and Mills have pointed out, in 1970 6 million workers chased the equivalent of only 3.2 million full time jobs. Being partially trained in such a labor market can be a significant disadvantage to securing steady employments.

Apprenticeship is an attractive form of training because it provides earning while learning. Apprentices are regular employees and are paid a wage which progressively increases as their level of skill advances according to a predetermined arrangement specified in the apprenticeship agreement.

Many apprenticeship programs have reputations for providing high quality training that leads to high paying skilled craft jobs with opportunity for advancement. Such training is highly sought after. Indeed, several well established apprenticeship programs normally have as many as 10 or 20 applicants for each training position available. Given such popularity, apprenticeship sponsors can be quite selective in choosing apprentices. For example, in manufacturing, apprenticeship slots are often reserved for existing employees and allocated in part on the basis of seniority. Also, many apprenticeship sponsors give preference to military veterans over other applicants. Perhaps most important, apprenticeship sponsors tend to view apprenticeship training as a major investment and thus choose apprentices who are "mature and settled down" and likely to stay with the firm or trade.

As a consequence of these and other factors, the age of a starting apprentice in the U.S. is in the mid-twenties. In this regard, apprenticeship in the U.S. and Canada are unique. Everywhere else in the world, apprenticeship is a system for training teenage youth. Although existing U.S. apprenticeships often provide excellent training, they are not commonly available to high school students or even recent high school graduates. Given the concern in this country over high rates of youth unemployment, you may be interested to know that the countries with the best developed apprenticeship systems in the world—West Germany, Switzerland and Austria—also have among the lowest relative rates of youth unemployment in the world.

## PERSISTENT ISSUES

Apprenticeship today faces many problems. Almost all of the important persistent issues can be classified into five key areas of concern; namely:

(1) Expanding and extending the use of apprenticeship into occupations for which it is appropriate, especially in occupations of national skill shortage;

(2) Maintaining and improving the quality and cost effectiveness of training offered through apprenticeship;

(3) Achieving effective equality of opportunity in apprenticeship training, especially for women, minority men and handicapped individuals;

(4) Identifying the appropriate role for government in apprenticeship, then deciding which is the federal role and which is the states' role. (This involves building a stronger private-public partnership and improving the federal-state partnership in apprenticeship); and

(5) Improving the relationship between apprenticeship and other training institutions, such as the vocational education system, JTPA training programs, military training, and training in colleges and universities, vocational rehabilitation and the veteran's educational benefit program.

Each of these areas has been at issue in apprenticeship for decades. And each will continue to be significant to apprenticeship in the future.

Most discussions of the significant issues facing apprenticeship put the need for expansion at the top of the list. As many observers have pointed out, the quantity and quality of apprenticeship training has widespread impact on the American economy. Training of skilled workers in apprenticeable occupations affects: the nation's position in international competition; our nation's military preparedness, especially the mobilization of defense-related manufacturing; the price and quality of goods and services obtained by consumers; backlogs and delivery schedules; and our nation's ability to take advantage of advances in technology or shifts in product markets on a quick response basis.

Advocates of apprenticeship point out that apprenticeship has a documented record of performance as an effective training system and they decry the fact that it is not more widely used.

Apprenticeship is certainly not widely used. In fact, more than half of the 738 occupations deemed apprenticeable by the Bureau of Apprenticeship and Training do not have more than 10 active apprentices in training nationwide. Indeed, as of December 1978, there were 149 apprenticeable occupations without a single apprentice!

But there is another side to this picture. The use of apprenticeship is concentrated within a few occupations and industries where it has flourished. Three out of four apprentices work either in construction, especially in the unionized building trades or in manufacturing, especially for larger firms. Both in unionized construction and in large-scale manufacturing, the vitality of apprenticeship is due to exceptional circumstances.

In large-scale manufacturing, there has been an unusually high level of attachment between worker and firm, permitting the firm to invest significantly in training with little risk of losing the investment. Yet relatively few employers in the U.S. are blessed with the low turnover rates among skilled workers that major manufacturers enjoy.

Unlike large scale manufacturing, construction employers cannot avoid high rates of employee turnover since their industry is so sensitive to cyclical and seasonal change. Indeed, given the extremely high volatility of construction employment, it is impressive that the industry has been able to sustain any significant long term skill training. Yet construction employers, with the encouragement and support of building trades unions, have been able to develop institutions that allow them to offer high quality training in an environment of high employee turnover; namely: multi-employer sponsorship of training and the industry training trust fund. These institutions, with considerable dedication and effort on the part of the industry's leaders, have allowed construction to build some of the best training programs in the country.

If this Committee is interested in how apprenticeship can be improved and expanded in the future, it should closely examine the excellent training now offered in certain manufacturing firms and in the building trades, especially using multi-employer sponsorship and the industry training fund.

From my experience with the Federal Committee on Apprenticeship, I am convinced that the problems facing apprenticeship are not insurmountable. They can be met through a process of dialogue between all of the parties involved. In arranging this oversight hearing, you have sparked a renewed discussion of apprenticeship. At very little public expense, and with active interest on the part of the Labor Department, the dialogue can be continued, the problems overcome and the promise and potential apprenticeship holds can be realized.

U.S. Department of Labor,
Employment and Training Administration,
*Washington, D.C., August 6, 1982.*

Hon. Raymond J. Donovan,
*Secretary of Labor, U.S. Department of Labor,*
*Washington, D.C.*

Dear Secretary Donovan: I am writing you to resign from my position as Chairperson of the Federal Committee on Apprenticeship. I am taking this action to protest the abysmal record of your administration regarding apprenticeship training.

Due to disinterest, inactivity and neglect on the part of your administration, the Federal Committee on Apprenticeship has become no more than a facade and I can no longer tolerate the frustration of serving as chairperson. For more than six months from September 1981 to April 1982, almost half of the memberships on the committee remained vacant awaiting your appointment of new members. More than a year ago, the budget for the committee was eliminated and the committee has remained in financial limbo ever since. Finally, on July 1, 1982 the charter for the committee lapsed—not because of any conscious decision within the Department but because the charter renewal papers have taken an extraordinarily lengthy time moving through the chain of command within the Employment and Training Administration.

Twenty-two of twenty-five members of the Federal Committee on Apprenticeship are representatives of the private sector and by charter the Committee reports to the Secretary of Labor. It is ironic that at the same time that the Department of Labor has been promoting greater public-private cooperation and urging local CETA prime sponsors to work with Private Industry Councils, the Office of the Secretary of Labor has been incapable of working effectively with its own private sector advisory group.

Most regrettably, such ineffectiveness in working with the Committee is missed potential. The members of the Federal Committee offer to your office a huge wealth of knowledge and experience in training and an enthusiastic resource interested in working with you. Your early policy statements emphasizing your concern for promoting training rather than income maintenance programs encouraged several committee members; but unfortunately, in the apprenticeship area, your actions have failed to match your rhetoric.

Curiously, relative to other training activities of the Department, it would take little time or funding to give a major boost to apprenticeship. Such a move could have a large effect because any public dollars would be multiplied and extended manyfold by private efforts and funds. American apprenticeship is primarily a voluntary privately sponsored and privately financed institution and will remain so. But precisely because it receives so few public dollars, it also receives little attention from Labor Department officials.

The bald truth is that after more than a year and a half into this administration, the Department of Labor has not achieved any positive accomplishments in apprenticeship training. Indeed there is only a litany of losses for apprenticeship. You have all but wiped out almost every funded activity in the Department affecting apprenticeship including Apprenticeship Information Centers and Targeted Outreach Programs. These cuts of programs aimed at women and minorities not only reduce availability of information regarding apprenticeship but also make it likely that fewer women and minority men will be trained through apprenticeship. Apprenticeship New Initiatives contracts which promoted new apprenticeships and demonstrated that apprenticeship training could be linked with vocational education in high school were also cut. All of these cuts were made across the board without respect to program performance.

Even the GATB testing service traditionally offered to apprenticeship sponsors by Job Service offices has a questionable future. Your attempted revisions of the Davis-Bacon Act would have undermined apprenticeship in the construction industry and replaced apprentices with helpers for whom there is *no* training requirement. All sponsored research on apprenticeship has been closed down except one project which itself has been badly mismanaged by the Department. The Department has even eliminated the state and national apprenticeship data system so that the only information on numbers of apprentices is now collected through an inferior data system operated by the EEOC.

Department officials have talked of decentralizing apprenticeship administration to the states without any consideration of implications of such a move nor any coherent plan for how that might be accomplished constructively. Strengthening apprenticeship at the state level is a worthy goal but difficult issues remain to be worked out and some important national roles will remain. For example, some minimal national standards need to be met. In our highly mobile society, transferability of skills is important. An ironworker trained in North Dakota ought to be prepared and able to work at the same trade in California.

The Employment and Training Administration recently has been reorganized demoting the Bureau of Apprenticeship and training to the bottom of the organization chart and inserting two to three additional layers of bureaucracy between the Bureau and the Assistant Secretary. Large numbers of staff vacancies including positions for state and regional directors have remained unfilled. BAT staff have been decimated by reduction-in-force notices and remaining workers have lived under constant threat of furlugh or future layoff. It is difficult to imagine a worse environment for accomplishing anything constructive. Personnel cuts are likely to lead to fewer registered apprentices.

If apprenticeship is to help meet the nation's need for increased skill training, the number of apprenticeship training places must be significantly expanded and the orphan status that apprenticeship now endures in the Labor Department must be eliminated.

Perhaps most of all, we must come to realize that training is indeed a joint enterprize deserving and demanding the close cooperation of both the private and public sectors. Further, it is a joint venture that strongly influences our nation's defense capabilities, productivity, economy and trade position in world markets.

I urge you to reconsider the apparent low priority you have placed on apprenticeship and the work of the Federal Committee on Apprenticeship. I hope you will work cooperatively with the next chairperson of the committee.

Sincerely,

ROBERT W. GLOVER,
*Chairperson, Federal Committee on Apprenticeship.*

Mr. HAWKINS. Thank you, Mr. Glover.

The last paragraph of your statement suggests that the Labor Department is not actively involved or interested, it seems, in apprenticeship training. Can you explain why that would be true?

Mr. GLOVER. I think it is because they feel they have no role, that this is really a State prerogative, that there is really no national function in the system that they need to serve.

There are a couple of other things that are going on. I mentioned that some of these issues are very persistent issues. They have been with us for decades, literally. And apprenticeship has its troubles with every administration. It is just that this one is particularly bad.

Part of this problem is that apprenticeship is funded—any kind of apprenticeship activity in the Labor Department is funded from discretionary funds or from piecemeal funds that are bootlegged from other kinds of sources. There is no dedicated funding for apprenticeship.

And during tight budgets, discretionary funds disappear. And given low priority, apprenticeship doesn't receive any kind of attention.

So I think that part of it is a matter of the philosophy of this particular Department. But part of it also is a structural matter, that although there is a very good act, the Fitzgerald Act, that directs the Secretary to undertake certain activities, there is no kind of dedicated funding for apprenticeship. I think that is part of the problem.

Mr. HAWKINS. When in comparison with other training programs, such as the Job Training Partnership Act; and prior to that, CETA; and prior to that MDTA, how would you rate apprenticeship training? Would you say that the Federal Government has neglected apprenticeship training and given more emphasis to these other programs?

Mr. **Glover**. I think so, and I think that is for a few reasons, one of which is that there is a lot of money riding on some of these other systems, like CETA, and the Job Training Partnership Act—this year, I think it is $3.5 billion.

If I were sitting in the role of Assistant Secretary of Labor, I would certainly pay attention to where those funds are going because I was responsible for those funds. And because there is very little money going toward apprenticeship, I think that would tend to get low priority.

Understand me, though, what I am not advocating is that a lot of money be put into apprenticeship. I don't think that is the proper course. But certainly it should receive more attention.

I think another reason that it doesn't receive very much attention is that it is a system that involves a lot of collaboration. It involves collaboration with the Department of Education, for example. It involves collaboration with a variety of industry people, union, nonunion, and so on. And a lot of these actors don't see eye-to-eye on every issue. And that makes that collaboration a difficult process.

So that is kind of another thing that makes this area difficult to get involved in.

But to answer your question, I think that apprenticeship has received a very low priority compared to many of the Labor Department activities you have indicated.

Mr. **Hawkins**. The collaboration, it would seem to me, is the very thing that is desirable. Over a long period of time this committee, and to some extent Congress itself, has been seeking this type of collaboration as making the end product much more successful in solving the problem.

We have had that problem in almost every employment and training program that we have undertaken. The Congress, I think, has been highly supportive of the idea and still talk about it—maybe we haven't achieved it. The very thing that you say is very difficult, collaboration is implied in the apprenticeship program and certainly should influence the philosophy of the Federal Government.

The other point that you make about the funding, it seems to me that that is a matter of choice. The Department itself, insofar as I know, and this is not referring to the current Department of Labor alone, has chosen to let funding for apprenticeship research in a discretionary capacity.

I have never known any interest or any request made, any interest demonstrated or any request made by any sector of labor on this particular subject before this committee.

I think the mere fact that we haven't had oversight is an indication of the lack of concern.

Now, putting all those things aside as to what has happened, the point is should this have happened? Should there be a more dynamic role played by the Department of Labor in, let us, say, pushing the apprenticeship program? Would it be desirable? Would it have, let's say, much more effect? Would it be much more cost effective? And would it be much more desirable in the long run if we put some of the interest that we have demonstrated in ad hoc programs—we seem to develop them during a crisis and then forget about them, and as soon as unemployment tends to go down—into apprenticeship?

Do you think that assuming that we did redirect the moneys into programs of this kind and given a Labor Department that had an interest in it, regardless of what administration that may be, do you think it would be desirable to place more emphasis in this direction?

Mr. GLOVER. Absolutely. I think that the story of apprenticeship is in large measure a story of unrealized potential. Almost every presentation I have heard about apprenticeship talks about if only it were used more widely; or if only these principles were applied to youth unemployment; or if only whatever.

I think there really is a lot of potential and a lot of mileage that this committee, the Congress, the Government, and the Labor Department, can get by investing more time and effort in apprenticeship. There is no question about that.

On the point of collaboration, I have been reading and rereading the National Apprenticeship Act and I noticed that the act, in 1937, directed the Secretary of Labor to, among other things, cooperate with the Office of Education. That is in the act.

I doubt that the Labor Department has had two conversations with the Office of Education about apprenticeship over the last year. There is a clear indication that they are neglecting their obligations under the existing law.

Further, I would like to point out that there is something they can do, that they can collaborate on. They sponsored a project under the CETA program —a very innovative demonstration project for starting in-school apprenticeships. That is where youngsters would get a start on apprenticeship in the senior year of high school.

This, it seemed to me, had a lot of potential for serving youth, high school youth, and recently graduated youth through apprenticeship, through this in-school idea. Yet, there has been no effort to try to mobilize a broader replication of that very successful demonstration project.

There are things that they could do, is what I am saying. There are items that could be on the agenda but the meetings are just not held at all right now.

Mr. HAWKINS. I don't have any more questions. Let me yield at this time to Mr. Erlenborn.

Mr. ERLENBORN. Thank you, Mr. Chairman.

Let me, first of all, apologize for having to go in and out. I asked the chairman to hold these hearings and I wish I could spend every minute this morning at this hearing, but I have another very important meeting next door and I am scheduled to testify before a Judiciary subcommittee in the middle of the morning.

Mr. HAWKINS. You may remember that I told you this would happen, to both of us. [Laughter.]

Mr. ERLENBORN. It is a condition of life here, I think.

But in any event, I am going to spend as much time as I can here this morning.

I do, Mr. Glover, appreciate your testimony.

You talked about the Labor Department both in this administration and prior administrations not giving the attention to apprenticeship that they should and in particular, this administration not seeing the national role versus the State role as an important thing.

Could you spell that out a little more for us? Tell us what, in your opinion, is the necessity of Federal attention to apprenticeship and activity by the Labor Department so that the apprenticeship programs can be healthy?

Mr. GLOVER. That is a good question and it is something that I may not have a full answer on but I think what I would like to do in response to that question is start by referring back to the National Apprenticeship Act, which says that the Secretary of Labor is authorized and directed to formulate and promote the furtherance of labor standards, and so on; to bring together employers and labor for the formulation of programs for apprenticeship, and to cooperate with the Office of Education.

This promotional role seems to be a real role that the Labor Department has nationally, OK.; and for some national interest too, because of considerations in the economy, I think.

The second idea that I would like to indicate on this question is that it seems to me there is some need for assuring there is some transferability of training. A sheet metal worker that is trained in New Orleans ought to be able to work in Miami or San Francisco.

We need some kind of minimal standards that are national standards to assure that kind of transferability.

A related point is that many of the organizations that work with apprenticeship, I am talking about industry organizations, both management associations, labor organizations, Government agencies such as the EEOC, and so on, are all established nationally.

I might add also, that what has impressed me in my dealings with apprenticeship is that some of the most interesting things, the most innovative things, are happening nationally.

Take a look, for example, at the industry training fund that the sheet metal industry has established. And what they are doing in terms of promoting curriculum, in terms of looking ahead to see what is going on in solar energy, what the implications of that are for the sheet metal industry, and so on.

I think that that kind of activity is happening nationally. There ought to be some kind of a relationship that the Labor Department has with that kind of national activity. There needs to be some kind of national focus.

A fourth thing is that there needs to be some kind of a central clearinghouse for disseminating information. Not all of the innovation is happening nationally. There are some local innovations that are quite interesting and worthwhile. There needs to be some way of telling what is going on in North Carolina to the other States. For example, North Carolina experimented this last summer with a very innovative idea, and that was hiring vocational instructors from vocational schools as apprenticeship training representatives; that is, the apprenticeship agency hired them for the summer.

I think it is really worthwhile to try to let other States know about this kind of innovation, particularly if it worked out, what its success was, what kind of steps need to be taken to assure its success, and so on.

There are all kinds of other innovations. Connecticut right now has a tax credit for training machinists through apprenticeship. I think it would be really worthwhile—I think a national role, to try to focus some attention on that, particularly if that tax credit approach is successful, to tell other States about.

There are a variety of other things—other innovations that are made by program sponsors that ought to get some national attention and visibility so that we can promote the rapidity of the learning that goes on in the system, and the transfer of information and knowledge.

There is another area, too—another good example of this particular element. There are probably 10 or 12 States that pay money to develop curriculum for apprenticeship programs; plus, I think there are 6 curriculum development labs that are sponsored under the vocational education moneys that are regional labs.

There is currently, to my knowledge, no mechanism to make sure that those labs and those curriculum and development units are not duplicating efforts; that is, there may be three different projects working on a curriculum for carpenters or a particular trade. If you had some sort of a clearinghouse or some sort of a coordinating mechanism, you could possibly eliminate some of that duplication. This is important because those funds that go to curriculum development are fairly rare and we ought to make the best use of those. So I see a variety of those roles.

There is another philosophical point. Two years ago I went to Germany and became an expert on the German apprenticeship system in about a week. But one of the things that I did learn was that Germany has an interesting philosophy about approaching the Federal role versus the role of the state or landers—what they call landers, in Germany.

In Germany, education is a state responsibility—clearly a state responsibility. But occupational training is a national responsibility. And the reason it is, is because of the strong implications human resource development has for the economy. So that is the rationale in Germany. The Federal Government gets involved in apprenticeship.

It seems to me that we might want to consider that. It is at least worthy of some consideration.

Mr. ERLENBORN. Thank you very much. I hope that these hearings may highlight the necessity of this Federal role and maybe lead to the Labor Department taking a more active part in the apprenticeship program.

I am due now to testify before the Judiciary Committee but I hope that you will have an opportunity in answering questions to explore the relationship between basic education, or maybe the lack thereof, as pointed out by the President's Commission on Excellence in Education, and vocational education—their relationship with apprenticeship.

I think there is some tension by vocational educators, at least some of them seem to feel that when they have finished training people for a year or so in a skill, that they are equal to apprentices, and the apprenticeship program is not needed.

I think in other places there is a good relationship between apprenticeship and vocational education.

I would like to hear your answer but I can't stay. As I say, I hope someone will—here's a volunteer who will explore that area.

Thank you.

Mr. Hawkins. I intend to submit to Mr. Glover a number of questions that I also wanted to ask but we feel that we don't have time. And I will include any of the questions that Mr. Erlenborn may add as well, and ask you if you would be so kind as to respond to these questions at your leisure——

Mr. Glover. I will try.

Mr. Hawkins [continuing]. And within the limit that you place upon yourself.

Mr. Hawkins. Mr. Nielson?

Mr. Nielson. Yes; I have several questions but I will limit them since our time is somewhat limited.

First of all, there has been a lot of criticism of the present training system, that it has not produced the kind of innovative approach that you want, and the apprenticeship program has been on the back burners, as you have indicated.

Can the apprenticeship program you visualize train skilled craftsmen for the challenge of the 1990's and beyond, or is it a here and now thing that just trains you for a specific job? Can it train for future jobs as things in industry change?

Mr. Glover. There are two things that I want to say to that. One is that I think the answer is "Yes," and I will give you two reasons. One is that the broad training emphasis in apprenticeship makes people more adaptable, that is, that whether——

Mr. Nielson. Excuse me. You said the broad training?

Mr. Glover. Broad training. Let me give you an example.

Mr. Nielson. The impression most people have is that apprenticeship is very narrow and very specific. Now, will you——

Mr. Glover. That is incorrect. I should say that for the bulk of apprenticeship, I mean—we are not talking about a homogeneous system out there. Not every apprenticeship program is like every other. But in general, there is an emphasis on broad training, that is, for example, apprenticeship can only occur in an occupation that is clearly identified and used throughout industry. So you can't use apprenticeship to train a helper occupation for X firm and to work on this lathe piece of equipment. And when a new lathe comes in or a milling machine comes in, then the person doesn't have any way of adapting.

Apprenticeship is designed to try to train people on a variety of equipment and also in the principles of what they are doing. So they not only know how to do it, but why they are doing what they are doing.

I think that kind of broad training, that kind of adaptability really is important.

Another thing that I learned in Germany was that contrary to the way we are going, which is mainly toward a lot of specialty occupations—we are getting more and more specialized in our occupations and in our training. Their apprenticeship program is consolidated so that they are reducing the number of apprenticeable occupations, and they are broadening the training that is offered.

It seems to me that that is a much better way to try to face the future. As a matter of fact, during the same period, we went from

400 occupations nationally recognized as apprenticeable to 738 occupations; they went from 700 to 400. They just went exactly the opposite direction that we did.

Mr. **Nielson**. Do you think our schools as presently constituted can produce students capable of meeting the industry requirements for the apprenticeship program or should we develop new types of schools for preapprenticeship programs?

Mr. **Glover**. New types of schools, did you say?

Mr. **Nielson**. Do we need to establish preapprentice programs in technical schools?

Mr. **Glover**. Let me say this: On the Federal Committee on Apprenticeship there was a lot of discussion among employers and also the labor representatives about lack of preparation for apprenticeship—that candidates were coming in and couldn't read a rule. There are lot of horror stories and all that.

It clearly indicated to me that we need some kind of better preparation in basic skills.

I don't know whether we need a whole system of specialized preapprenticeship or a whole preapprenticeship institution, or whether we just need to improve the system we have got already. It certainly does need some attention. I don't have the answer to the preapprenticeship question.

What I do know is through CETA and through our Job Partnership Act now, and through a wide variety of programs in vocational education, there are some effective preapprenticeship programs out there. I think we can learn from those.

Mr. **Nielson**. I appreciate your answer there but I need to develop it further.

You mention the cooperation between the Labor and Education Departments—they have to cooperate; the act calls for that. And yet there is no link between the two. It has been proposed by at least two experts in Government and reorganization that we ought to have a Department of Education and Labor—have them both in the same Department because so many vocational education and other things tie to both Departments.

Is that something that would be offensive to you to combine the two? Do you think there would be better training through a vocational program, the apprenticeship, the job training partnership, and all of those other things? Would it be better if they were consolidated directly?

Mr. **Glover**. That is a good question. I am not sure that I can give a definitive answer on that.

The idea is attractive—it has some very attractive features. On the other hand, the traditional argument for keeping the apprenticeship agency in the Labor Department is that because 90 percent of apprenticeship is spent on the job. And the on-the-job portion, you need some kind of agency that has authority over labor standards.

The basic reason that the Fitzgerald Act passed in 1937 was to promote the welfare of apprentices, you know, who are being exploited on the job.

Mr. **Nielson**. There was no Department of Education at that time so it was done that way. But in view of the present situation, the lack of cooperation between the two Departments may be because they each have their little fiefdom and they don't want to cross lines and, therefore, vocational and apprenticeship and job training, things do fall between the cracks.

Let me ask you an easy question.

Mr. GLOVER. One more response to that and that is that I am not sure that we solve all the problems by putting everything into one department, and I draw on the Labor Department experience. With CETA and now with Job Training Partnership Act, I am not sure if we could say that because those two activities are in the same Department, that they are coordinated. It is not just a matter of that organization.

But as I say, there are some attractive features about the idea of moving them together in some way. I don't know exactly what the organizational method would be or what the implications would be.

Mr. NIELSON. Let me ask you an easy question.

Mr. GLOVER. All right, good.

Mr. NIELSON. You spent considerable time explaining what the Federal role should be in the apprenticeship program. You seem to emphasize two things. One, it is a go-between among the States so that the good things that one State is doing will be disseminated and told to other States.

Second, it will get national attention and promotion.

Why can't that be done through the NCSL, National Conference of State Legislators, exchange of ideas, model legislation? Why can't that be done at a State level without an expensive Federal role?

Mr. GLOVER. I am not familiar with—the Council of State Legislators? Is that right?

Mr. NIELSON. National Conference of State Legislators. They meet quite regularly; they compare notes on the legislative activities in the States; they prepare model legislation for the various States to look at. A lot of cooperation exists among States and it doesn't require many Federal dollars; in fact, none at all. Have you tried that route is what I am saying?

Mr. GLOVER. No, I haven't thought about that route. I mean, this is the first time the idea has even been broached.

My opinion would be fairly negative about that and the reason is it seems to me that just because of the nature of the organization that you are dealing with, the national organization you are dealing with, and also the other national agencies such as the EEOC, for example, and the Department of Education—you really can't have apprenticeship promoted nationally on a contractual arrangement completely. You really need some kind of a national focus for it in the national agency.

Mr. NIELSON. One more suggestion. What about attractive tax incentives to provide apprenticeship programs? Can't we do more in the ways and means approach? In other words, I can see this being attacked from the education standpoint, the labor standpoint, the ways and means standpoint, and then through the State legislators.

It seems to me we need to explore all of those roles before you can embark on a rather large-scale Federal program.

I will close with that comment.

Mr. GLOVER. The program in Connecticut that I mentioned earlier probably is worth looking at to see how that tax credit worked out and whether it did increase the number of apprentices in the machine trades and so on.

There are a number of experiments going on at the State level you may be aware of but that is one of them you might want to look at.

There is another idea that has floated around discussion circles, I guess, and that is using some sort of a levy grant system such as used in Ireland and England and so on where employers who did not train would be taxed, and those who did train would not have to pay the tax.

On the face of it that has a lot of attractive features as well. And I think it is worth considering.

Mr. NIELSON. They cooperate willingly because they have to; is that what you are saying?

Mr. GLOVER. What's that?

Mr. NIELSON. They cooperate willingly because they have to; is that what you are saying?

Mr. GLOVER. Right.

Mr. NIELSON. Mr. Chairman, we have a natural gas bill, to regulate natural gas, or deregulate it, or whatever happens, and I have got to go to that. I am sorry.

Mr. HAWKINS. Thank you, Mr. Nielson.

Mr. Glover, as the Chair indicated, I will submit some questions to you and if you are so inclined we certainly would appreciate your answering them. We will keep the record open 2 weeks, anyway, and if you would answer in that time we certainly will include those answers along with your testimony this morning.

I think you have been extremely helpful to the committee and I certainly want to congratulate you on the expertise that you have demonstrated before the committee this morning.

Mr. GLOVER. Thank you.

Mr. HAWKINS. Thank you.

The next panel will consist of these witnesses who are present here. It is an education and training panel. We would appreciate these witnesses being seated at the witness table: Dr. John Wells, the American Vocational Association; Ms. Julie Walter, manager of training, Crouse-Hind Co.; Dr. Dan Lyons, director of training, Goodyear Tire & Rubber Co.

We appreciate the panel and we look forward to your testimony. May I suggest that the prepared statements be put into the record without any change, and ask the witnesses to summarize from their statements so as to leave time for questions. We anticipate bells will be ringing in about 30 or 45 minutes, so I know at that time there will be a great deal of confusion. So we try to make as much speed as possible but at the same time recognize the witnesses, their statements, and their answers to questions.

Dr. John Wells, suppose we hear from you first.

## STATEMENT OF JOHN WELLS, CONSULTANT, AMERICAN VOCATIONAL ASSOCIATION, ACCOMPANIED BY DEAN GRIFFIN, DIRECTOR, GOVERNMENT RELATIONS

Mr. WELLS. Good morning, Mr. Chairman, and members of the committee.

I am John Wells, consultant of industry services with the Division of Vocational Education in the State of Florida. My present duties are that I am an interface between State government and industry to set up training programs.

I think it is quite timely and I appreciate the opportunity to appear before this committee.

We have a system in America that is called apprenticeship training that I think is a viable system and should be continued. It is a complex system involving several agencies for delivery, one of which is vocational education. You have sponsors and you have possibly in some cases representation of organized labor.

It is the collaboration and coordination of these several agencies that make the system work. And in consideration of the American educational system, we have had some critics that emphasized that the student coming out of our school system is deficient in math and science.

But I think if we considered the system that we should consider the system in its totality. Part of that is the apprenticeship system as well as the vocational education system.

The secret of the whole apprenticeship program is the collaboration and the willing participation of all the different delivery agents. If we institute programs that would entice more people to apply for apprenticeship, qualified people, out of the vocational schools, out of other walks of life, we must not forget that the sponsor of a program is one of the most important elements—he is, in the present system, bearing costs, or most of the costs, of the system, and provides for the pay of an apprentice.

I think that in summary of my comments that the vocational education and the apprenticeship system are complementary rather than competitors in the training of skilled workers. Vocational education has traditionally provided an entry level person. Apprenticeship needs entry level persons for its survival.

Vocational education also furnishes the related instruction and most of the cases of apprenticeship programs are either through bearing the cost of the instructor or through vocational schools.

I would like to see additional attention on the apprenticeship system from the highest levels of Government, possibly even designating a week as Apprenticeship Week, that the Federal Government is behind the apprenticeship system; that it is a viable method of training skilled workers. And in order to survive in this age of change and technology, that we need the apprenticeship system. Vocational education will provide input to the apprenticeship system.

I would also like to see in addition to the coordination between the different elements of the apprenticeship system—I would like to see some effort made in the apprenticeship system, at least the people that are instituting the apprenticeship system, I would like to see some effort made toward making some of the programs more competency based rather than time based. That has been one of the criticisms of the apprenticeship system, that it takes too long, that we can't afford the time—also provide opportunity for those persons that have prior experience to enter into the program without going over the same thing that they have already been experienced in.

I would also like to see some effort in the staffing of the Departments of Labor and Education that specifically addresses the problem of apprenticeship. When it comes down to the grassroots level, the individuals that are involved in apprenticeship are very adamant in their belief in the system. They need to be encouraged at all levels of all the training agencies, they need to be encouraged that their system is producing what the Nation needs. We need America to recognize that.

In summary, and in conclusion, I feel that the apprenticeship system is indispensable to the effort providing advanced-skill-level training. It is especially true in times of these rapid technological changes in the workplace where the worker is there on the job where the change is taking place.

I think that the guidance given in Federal legislation has a significant impact on the programs. And I would encourage a stronger link between vocational education and the other apprenticeship agents.

We must encourage industry to participate or we won't have any apprenticeship programs to deal with.

I realize that I have rambled somewhat, Mr. Chairman. I have tried to highlight some of my points, and I am open for questions, sir.

[The statement of John Wells follows:]

### PREPARED STATEMENT OF DR. JOHN W. WELLS, CONSULTANT IN INDUSTRY SERVICES TRAINING, DIVISION OF VOCATIONAL EDUCATION, FLORIDA DEPARTMENT OF EDUCATION, TALLAHASSEE, FLA.

Mr. Chairman and Members of the Subcommittee, I am John Wells, Consultant for Industry Services Training in the Division of Vocational Education, State of Florida. Accompanying me is Dr. Gene Bottoms, Executive Director of the American Vocational Association. I am pleased to have the opportunity to appear before this committee and present my views regarding apprenticeship programs, the efforts of vocational education in apprenticeship and my recommendations for improving the effectiveness of the coordination between these programs. My statements are based upon my experience in the State of Florida and my research as I prepared my Doctoral Dissertation on apprenticeship.

My employment experience in education spans from that of a high school teacher, junior college instructor and administrator. I am currently working at the state level to interface with industry in order to establish industry training programs in the State of Florida.

Throughout these experiences I realized the value of apprenticeship training and now recognize the need to closely coordinate vocational education and apprenticeship training.

In this statement, I will address three points:

(1) Apprenticeship is a viable and valuable means of instructing advance level technical and skilled workers and there is a need to continue viable apprenticeship programs.

(2) Vocational education programs in the states have a history of involvement in apprenticeship programs and there is a need to continue and improve this involvement.

(3) My recommendations for improving the nation's apprenticeship program and encouraging closer coordination and cooperation between registered apprenticeship programs and vocational education.

#### APPRENTICESHIP PROGRAMS ARE NEEDED

The nation's apprenticeship program, while it is the largest private sector training program producing skilled workers, is often misunderstood by the American public. This system certifies approximately 100,000 skilled workers each year in over 800 occupational categories, yet it does not meet all the require ments this nation needs to respond to the nation's skilled worker shortage.

We know that the United States productivity growth rate has lagged behind foreign competition for more than a decade. Studies by Harvard economist, James Medoff calculates that as much as 69% of the drop off in productivity growth may be due to a labor market imbalance or a misfit of people to jobs. Given this fact, there is a need for a viable apprenticeship program that can produce advanced level technical and skilled workers to meet the needs of business and industry.

In addition to the apprenticeship training programs, each state has a vocational education delivery system. However, the role of vocational education has been much different than that of the registered apprenticeship program. Vocational education as a state and local delivery system in education has not been called upon to produce advance level workers. The entry level worker has been the focus of vocational education. The role of vocational education in preparing advanced level workers is seriously questioned when the students from the United States compete in the International Skill Olympics with apprenticeship students from other countries. In competition with students from all over the world the United States had lower average scores than either the European or Asian nations.

An analysis of the United States competition in the International Skill Olympics draws these conclusions:

(1) The performance of our best young craftpersons from vocational education when put in competition with the best of the other western industrialized countries, seems to be in direct correlation with what is happening in the international market place. The countries that ranked the highest in international competition, are those giving the United States the greatest competition and whose products Americans are buying because their craftsmanship is better.

(2) The importance of time on task is well documented. In the United States we expected our students to develop the same skills in one or two hours a day for a school year or two that other nation's students learn over three or four years in intensive apprenticeship type programs. The American vocational-industrial programs in the public schools simply do not provide the time it takes to develop and perfect the knowledge and skills needed by skilled craftspersons.

The implication is that the concept of an apprenticeship program is essential to producing the nations skilled and technical level workers and that both apprenticeship and vocational education must be encouraged to collaborate in a greater way. When workers are only prepared for entry level skills, the nation cannot expect them to exhibit advanced level characteristics.

As the United States studies the problems in education, it is becoming apparent that there is a need to establish goals for our nation's education and training systems. Apprenticeship must be a part of this newly directed effort. The recent studies critical of American education point out a shortage of math and science skills. However, the Congress must realize that there is also a shortage of advanced level technical and skilled workers in the United States and that it is critical to view the totality of the shortages when addressing the problems with American education.

### VOCATIONAL EDUCATION PARTICIPATING IN APPRENTICESHIP

Vocational education programs in every state are actively involved in the delivery of services to apprenticeship programs. There are 181,000 registered apprentices taking related instruction from vocational education programs. In my own State of Florida, we report approximately 6,000 apprentices taking related instruction through the vocational education delivery system.

In addition to funding related instructional programs for apprentices, vocational education is one of the feeders for apprenticeships. From national studies it seems evident that many of the apprentices go into their apprenticeship program after receiving some instruction in vocational education. The recent study conducted concerning the metal trades indicate that as high as two out of every three of their apprentices came from vocational education.

These two connections, however, should be strengthened and others sought as the Congress considers apprenticeship programs. By purposefully strengthening the connection between apprenticeship programs and vocational education, the quality of the local vocational education programs can be improved. The primary criticisms of vocational education as it relates to apprenticeship are:

(1) The instructor may not be totally familiar with the field, with the purposes of organized labor or the employment situation of the apprentice.

(2) Sometimes educational institutions require the apprentice to take a prepackaged course, one that is perhaps relevant to the educational and individual needs of the apprentice but not directly applied to the specific trade.

These are barriers that must be overcome, if there is to be cooperation between the apprenticeship and vocational education. This barrier can be removed and the connections between apprenticeship and vocational education can be strengthened as we focus on the modernization of vocational education and the involvement of employers in the educational process. This is critically necessary if the educational programs are to be meaningful and in tune with industrial needs.

## RECOMMENDATIONS

As the result of my studies and working with apprenticeship and vocational education in the State of Florida, my recommendation for apprenticeship programs could be summarized in three points:

(1) We need to change our thinking about the requirements for the apprenticeship program itself.

There must be a mechanism to encourage apprenticeship programs to be competency based rather than time based. I recommend that we provide a means for providing apprentices with credit for prior experience, levels of maturity, levels of understanding and for other educational programs and activities. Many times the apprenticeship programs could benefit by being flexible enough to take into account the prior experience and education of an apprentice.

(2) There is a need to encourage experimental efforts to connect vocational education and the apprenticeship program.

We recognize the need for a comprehensive system of indepth training in this nation. An adequate link between vocational education and the apprenticeship program could assist with providing comprehensive employment and training programs. While coordination between secondary and postsecondary vocational education is not a new idea, it is critical for this coordination to be a part of vocational education and apprenticeship. Traditionally secondary vocational education programs are concerned with training students for entry level employment. High school graduates taking a 2-hour course each day cannot be expected to compete with a 4-year program in high technology training. Nor with the extended 4-year program of the apprenticeship program. However, the coordination of the two systems could be mutually beneficial. The involvement of industry in vocational education can help improve the employment status of vocational education graduates and help convince industry that vocational education would provide competent employees for the labor market.

In addition to the involvement of vocational education in the pre-apprenticeship arena, there is a need for collaborative efforts between employers, organized labor, and vocational education to enhance the advance skill level of vocational education students and apprentices. Experimental efforts are needed which would encourage the connection between vocational education and apprenticeship programs in advanced training and in the employment of vocational graduates and apprentices. Consortia of employers and/or labor unions should be encouraged to take vocational graduates or advanced level students and work with them in an apprenticeship program to improve their skills. This would contribute significantly to easing the problem of advanced level employers and would enhance cooperation between vocational education and apprenticeship.

(3) The apprenticeship program must be addressed nationally and in every state so the image of these programs can be brought into the 1980's.

It is critical to expand the number of individuals enrolled in the apprenticeship programs to meet the nation's need for skilled workers. It is not simply a matter, however, of soliciting additional persons. It is a matter of creating a business/organized labor, partnership to adequately finance apprenticeship programs, and coordinating them with the labor market needs.

In order to expand the numbers in apprenticeship programs in order to meet the needs for skilled workers, there must be an improved flow of information about the apprenticeship program and in some instances a redirection of the administrative structure responsible for apprenticeship training.

There is a need to define the role of vocational education and apprenticeship at the highest levels. The Department of Education should establish long-range goals to meet the needs of the nation's employment and training through apprenticeship and vocational education.

The effort should include adequate staffing in the Departments of Labor and Education in order to assure that apprenticeship is a vital and integral part of the nation's education and training efforts. This would call for appropriate staffing and funding commensurate with the national contribution to a skilled labor force that can be made by apprenticeship programs.

The Congress should encourage a national campaign to publicize the nation's apprenticeship programs by designating a national apprenticeship training week and calling attention to the need for expanding the nation's capacity to train advanced level and skilled workers.

As the Congress considers apprenticeship training, I want to suggest that legislation currently before the Congress could contain provisions to enhance the over-all effort. The Vocational Education Act (H.R. 4164) is now before Congress. I encourage the Congress in this legislation to incorporate provisions to strengthen the coordination and cooperation vocational education and apprenticeship programs. This should be done both through language in the bill and through funding of specific programs to encourage employers and organized labor to work with vocational education in the delivery of apprenticeship type programs. In addition, the language of the Vocational Education Act when it is reauthorized, should recognize that there is a need for advanced level technical and skilled workers and recognize that apprenticeship and vocational education programs need to be strengthened in the areas of math, science, technology and computer education in order to provide the skills that workers need both through apprenticeship and as they enter employment.

### SUMMARY

In conclusion, Mr. Chairman, the nation's apprenticeship system is indispensible to the effort of providing advanced skill level workers. It is especially true in times of rapid technological change in the work place because the worker is the one who must apply change to the job.

The efforts at the national level should be increased to make improvements in and strengthen the apprenticeship programs. The guidance given in federal legislation has significant impact on these programs. Therefore, we would encourage a new look at the structure of apprenticeship programs and we would seek a stronger link between them and the nation's enterprise of vocational education. With this thrust, I believe that business and industry will provide stronger support to apprenticeship. This support is needed if we are to have successful apprenticeship programs.

Mr. HAWKINS. I think your points have been well made, Dr. Wells.

Let us hear from the other witnesses first and we will direct the questions to all three.

Ms. Walter, Julie Walter, manager of training, Crouse-Hinds Co.

## STATEMENT OF JULIE E. WALTER, MANAGING DIRECTOR OF TRAINING, CROUSE-HINDS

Ms. WALTER. Thank you, Mr. Chairman, gentlemen. I will be very brief.

The importance of improving productivity in business and industry, both quantitatively and qualitatively, is apparent to everyone.

Industry is currently involved extensively in career educational programs for their employees. Crouse-Hinds is among the leaders in this involvement. I have attached a brief summary of our overall training with your letter.

The programs are not only designed for immediate needs but to give assistance for preparing for future growth.

In addition, there have been a number of Government-funded programs designed to encourage high school students to consider careers in industrial technology. Entry in the field is, among other ways, obtainable through various trades apprenticeship programs.

Regrettably, at the same time, society at large is discouraging selection of such training by implying that such a career path is somewhat less acceptable than a 2-year liberal arts degree.

This misplacement of values is historical in the main but is now both inappropriate and unproductive.

With this in mind, we propose that men and women who successfully complete an approved 4-or 5-year apprenticeship program be given the opportunity to take a Federal or State examination covering their particular apprenticeship studies.

A passing grade would automatically make them eligible for an associates 2-year degree in technology from the State University in their area, either where they live or work.

By establishing this career path we will not only be encouraging men and women to consider technical training, but we will be giving long overdue recognition to the capabilities of our technically skilled, gifted employees.

Thank you, Mr. Chairman.

[The prepared statement of Julie Walter follows:]

CROUSE-HINDS,
*November 14, 1983.*

Hon. AUGUSTUS F. HAWKINS,
*Chairman, Subcommittee of Employment Opportunities, Committee on Education and Labor, House of Representatives, Washington, D.C.*

DEAR CHAIRMAN HAWKINS: The importance of improving productivity in business and industry, both quantitatively and qualitatively, is apparent to most everyone.

Industry is currently involved extensively in career educational programs for their employees. Crouse-Hinds is among the leaders in this involvement. (See attachment.) The programs are not only designed for immediate needs but to give assistance in preparing for future career growth.

In addition, there have been a number of government-funded programs designed to encourage high school students to consider careers in industrial technology. Entry in the field is, among other ways, obtainable through various trades apprenticeship programs. Regrettably, at the same time, society at large is discouraging selection of such training by implying that such a career path is somewhat less acceptable than a two-year liberal arts degree. This misplacement of values is historical in the main but is now both inappropriate and unproductive. With this in mind, we propose that men and women who successfully complete an approved four (or five) year apprenticeship program be given the opportunity to take a Federal or State examination covering their particular apprenticeship studies. A passing grade would automatically make them eligible for an Associates (2 year) Degree in Technology from the State University in their area (either where they live or work).

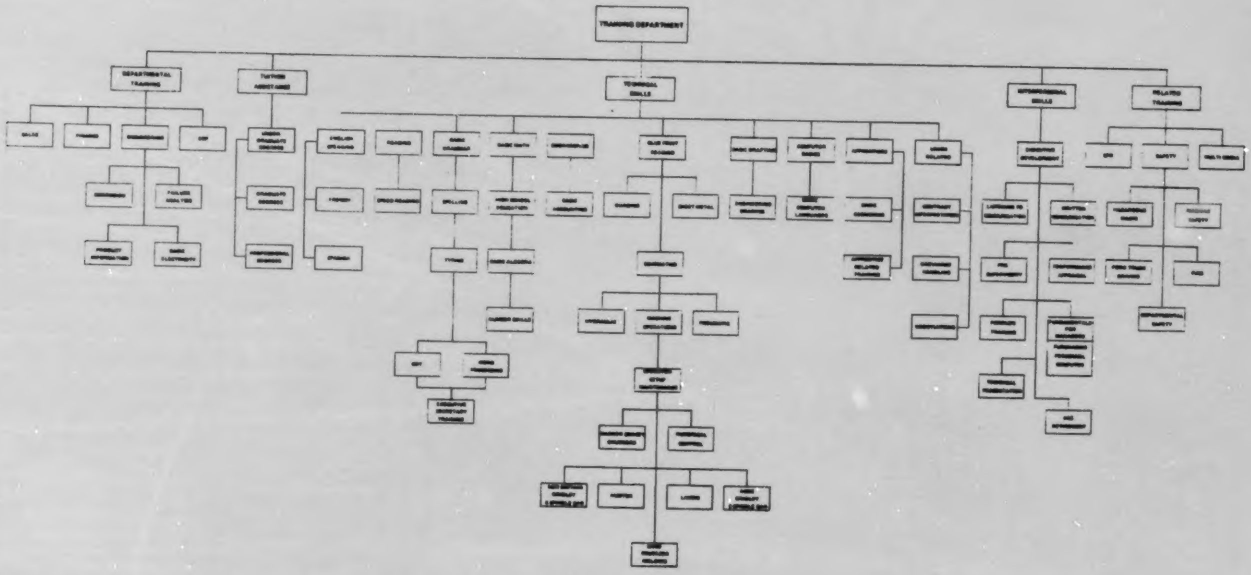
By establishing this career path we will not only be encouraging men and women to consider technical training, but we will be giving long overdue recognition to the capabilities of our technically skilled (gifted) employees.

Sincerely,

JULIE E. WALTER,
*Manager of Training.*

Attachment.

CROUSE-HINDS ELECTRICAL CONSTRUCTION MATERIALS
Division of Cooper Industries, Inc., Syracuse, NY 13221 USA


TRAINING DEPARTMENT
TECHNICAL SKILLS

BEST COPY AVAILABLE

Mr. **Hawkins**. Thank you, Ms. Walter.

Ms. **Walter**. I will respond to any questions that you like regarding our program.

Mr. **Hawkins**. I am sure we will have a few in just a few minutes.

Dr. Dan Lyons, director of training, Goodyear Tire & Rubber Co. Dr. Lyons, we welcome you.

## STATEMENT OF J. DANIEL LYONS, DIRECTOR OF TRAINING, GOODYEAR TIRE & RUBBER CO.

Mr. **Lyons**. Thank you, Mr. Chairman, gentlemen.

The Goodyear Tire & Rubber Co. has had an active, continuing apprenticeship training program since 1925, and it still continues. We firmly believe that the effectiveness and efficiency of our craft training ranks with the very best in American industry.

An issue that has come up several times in the discussion here this morning so far, is the reference to competency-based training, and that is the one issue I really wish to address.

We believe that the critical central issue in apprenticeship training is that the wasteful, medieval concept of time-based training must be totally discarded in favor of competency-based training. The superiority, the validity, the practicality of competency-based training has been thoroughly and repeatedly demonstrated and documented in technical training throughout industry and in the military services.

Within Goodyear, we are producing craft persons in 15 to 18 months whose performance is clearly superior to those previously trained by traditional apprenticeship programs of 36 to 60 months duration. We are totally committed to the competency-based format.

Several years ago, we made it clear we would no longer participate in time-based apprenticeship programs. As a result, and with a very considerable assistance and persistence of the Ohio State Director of the Bureau of Apprenticeship Training, Mr. Daniel McCarthy, we waged a successful effort to obtain DOL certification of our competency-based apprenticeship programs for maintenance craft personnel in our plants.

Frankly, we find it very difficult to understand the resistance which we encountered in obtaining that certification. On the contrary, we feel that the Department of Labor should demand and require that all apprenticeship programs be totally competency-based.

It is obvious that time-based traditional programs, which extend training time far beyond that which is necessary to acquire the required skills and knowledge, are inefficient and wasteful of financial resources and of human talent.

U.S. business and industry, engaged in increasingly severe and sophisticated global competition, can no longer tolerate this waste.

What may not be so obvious is that competency-based training programs consistently produce graduates who are better qualified than those from the traditional time-based programs.

Conclusive documentation for that assertion is available from the American Society for Training and Development, the National Society for Performance and Instruction, the Human Resources Research Organization, the United Brotherhood of Carpenters and Joiners through their PETS program, and many, many other sources.

Furthermore, the State vocational technical education systems have almost universally adopted competency-based training with excellent results. We have been well pleased with the products of those vo-tech schools.

The rapidly changing needs of industry occasioned by technological advances, the need to rapidly upgrade job levels of women and minorities, and the requirement to provide new skills to displaced workers in minimal time all demand that we utilize the best methodology that modern instructional technology can provide.

That methodology rests on the total and complete acceptance and implementation of competency-based training. We in industry are interested in competency, not credentials.

If industry encounters continuing resistance to such implementation to apprenticeship programs, the temptation to totally withdraw from the apprenticeship system will be very, very strong.

Thank you.

Mr. **Hawkins**. Thank you.

[The prepared statement of Dr. J. Daniel Lyons follows:]

### PREPARED STATEMENT OF DR. J. DANIEL LYONS, DIRECTOR OF TRAINING, THE GOODYEAR TIRE & RUBBER CO.

I am Dr. J Daniel Lyons, Corporate Director of Training of The Goodyear Tire & Rubber Company, a position which I have held for the past six years. Prior to joining Goodyear in 1977, I was, for 24 years, a Research Scientist with the Human Resources Research Organization engaged in training research and development, primarily for the United States Army.

The Goodyear Tire & Rubber Company has had an active, continuing apprentice training program since 1925. We estimate that we have graduated approximately 2,000 apprentices domestically. We invest on the order of 5 million dollars per year in apprentice training in our domestic plants. We firmly believe that the effectiveness and efficiency of our craft training ranks with the very best in American industry.

My remarks will be rather brief because I have been asked to address one specific facet of apprenticeship training. We believe that the critical, central issue in apprenticeship training is that the wasteful, medieval concept of time-based training must be discarded in favor of competency-based training. Competency-based training is also known as "performance-based training", "criterion-referenced instruction", "performance oriented training", "objective-based training", and "mastery learning". These terms are essentially equivalent and refer to a way of organizing and managing instruction in which prespecified performance criteria are achieved by each qualified learner. The student proceeds through the training on the basis of demonstrated competency rather than on the basis of elapsed time. The superiority, validity, and practicality of competency-based training has been thoroughly and repeatedly demonstrated and documented in technical training throughout industry and the military services. Within Goodyear we are producing craft persons in 15 to 18 months whose performance is clearly superior to those previously trained by traditional apprenticeship programs of 36 to 60 months duration.

The Goodyear Tire & Rubber Company is totally committed to competency-based training. Several years ago we decided that we would no longer participate in time-based apprenticeship programs. As a result, and with the considerable assistance and persistence of the Ohio State Director of the Bureau of Apprenticeship and Training, Mr Daniel McCarthy, we waged a successful effort to obtain DOL certification of our competency-based apprenticeship programs for maintenance craft personnel in our plants.[1] Frankly, we find it difficult to understand the resistance which we encountered in obtaining certification. On the contrary, we feel that the Department of Labor should demand and require that all apprenticeship programs be competency-based.

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[1] For the record, the registration number is N-92012, dated Oct. 9, 1981.

It is obvious that time-based traditional programs, which extend training time for beyond that which is necessary to acquire required skills and knowledge, are inefficient and wasteful of financial resources and human talent. U.S. business and industry, engaged in increasingly severe and sophisticated global competition, cannot tolerate this waste. What may not be so obvious is that competency-based training programs consistently produce graduates who are better qualified than those from traditional time-based programs. Conclusive documentation of that assertion is available from the American Society for Training and Development, the National Society for Performance and Instruction, the Human Resources Research Organization, the United Brotherhood of Carpenters and Joiners (PETS program), and many other sources.[2]

Further, the state vocational technical education systems have almost universally adopted competency-based training with excellent results. We have been well pleased with the products of the vo-tech schools.

The rapidly changing needs of industry occasioned by technological advances, the need to rapidly upgrade job levels of women and minorities, and the requirement to provide new skills to displaced workers in minimal time all demand that we utilize the best methodology that modern instructional technology can provide. That methodology rests on the total and complete acceptance and implementation of competency-based training. If industry encounters continuing resistance to such implementation in apprenticeship programs, the temptation to withdraw from the apprenticeship system will be very strong.

Mr. HAWKINS. Dr. Wells, you indicated in your opening remarks that it seems that the Federal Government is not behind the apprenticeship system. Is that the correct reading in essence of one of the points you made?

Mr. WELLS. Yes, sir. I feel that the visibility of the apprenticeship program is not highlighted at the national level, and I feel that it should.

I would like to introduce, Mr. Chairman, Mr. Dean Griffin, of the American Vocational Association, who is here with me this morning.

Did I respond to your question properly, sir?

Mr. HAWKINS. Mr. Griffin's name will be entered into the record as being present and if he cares to respond to any of the questions, feel at liberty to do so.

Mr. GRIFFIN. Yes, sir. That is my purpose here today, just to respond to questions if you wish.

Mr. HAWKINS. Thank you.

I was going to follow up on that question, Dr. Wells. It is not so clear to me and I think Dr. Lyons also intimated the problems involved in apparently treating apprenticeship training as a stepcousin and not giving it the importance that it deserves. I am not so sure just why this should be. If the program has the virtues that we have heard this morning, it is very difficult to understand why there has been such a reluctance then to expand the program and to give it the recognition that it deserves.

Mr. WELLS. That would deserve a great deal of attention and study. Possibly some of the reasons are that it is a long program, that they do cover a broad area in their own particular aspect of the industry. In some cases this may work to the detriment of the system itself.

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[2] See also Department of Labor report DLMA20-11-78-18-1, March 1981. "Performance-Based Training in Apprenticeship and An Overview of the Wisconsin Apprenticeship System."

I wouldn't go so far as to say that I would make a sweeping change of the apprenticeship system and go completely competency-based. I think it should be selective in those areas that could be.

I am apprehensive where some apparently good ideas come about and then a few years later down the road we find out, hey, we missed this particular little point, and the whole system is not that great.

I am reminded of the new math which we were gung-ho on a few years ago, and we find out that possibly rote memory of math still has its points in our educational system.

Mr. GRIFFIN. Mr. Chairman, just a note. We have seen over the years in the Federal Vocational Education Act that the value of the Vocational Education Act has far exceeded the dollars put in there. We know that the attention of the vocational education at the Federal level sends a signal, both to State and local. So as we work into this Vocational Education Act, we are wanting to discuss with you perhaps some things in the new Vocational Education Act that can send a signal to the States and local communities about the importance of apprenticeship training, the coordination of those programs with vocational education.

We are talking, I think, about a signal as much as anything else.

Mr. HAWKINS. Dr. Lyons, you made the point that the current time-based training approach is wasteful, and so forth, and that your particular company has been in the business of apprenticeship training since 1925. That is a quite a long time.

This morning, Mr. Glover, I think, made the point that the program has had greater success in the building trades rather than in manufacturing; and yet yours is a manufacturing company. Are you rather unique or would you agree that manufacturing companies as opposed to construction companies have been somewhat inactive or not well represented?

Mr. LYONS. I am not quite sure, sir, if I follow the point of your question.

Mr. HAWKINS. The point, I think, was made that there has been probably on the reluctance of manufacturing companies to develop apprenticeship programs.

Mr. LYONS. Oh, yes, sir.

Mr. HAWKINS. Your company is one that has?

Mr. LYONS. Yes.

Mr. HAWKINS. Now——

Mr. LYONS. But what we haven't done is——

Mr. HAWKINS [continuing]. Is that at all possible a unique situation.

Mr. LYONS. I don't think it is unique but, also, we haven't done it in all possible cases.

Our concern is being sure that we have people adequately trained in the crafts to work in our plants. Generally speaking, they are maintenance crafts—pipefitting, electricians, generally what we would call maintenance craft.

We will implement apprenticeship training programs in our plants so long as it is—maybe it is too strong to say—convenient to do so. If we run into roadblocks, problems with rules and regulations of the apprenticeship system, we will go ahead and train our crafts people in our own way. Because that is our mission, is to maintain those plants. We are not primarily there to train apprentices. We will do it if we can mesh with the system. In some cases we have been very successful with that; in other cases, not so successful, and we have gone our own way.

Mr. HAWKINS. Is that the partial explanation for the distinction between the time-based training approach and the competency-based training approach that you so strongly advocated; that your training is designed specifically for the company itself, that it isn't a broadly based type of training? You expect to keep those that you train. You are not training them for some other company?

Mr. LYONS. No, but---

Mr. HAWKINS. You are training them specifically and hopefully to stay with the company.

Mr. LYONS. That is true.

Mr. HAWKINS. Now, in other instances, the training is of a much broader character because it is based on the concept that individuals move from one place to another and from one company to another and, therefore, the broader training in the long run may be as efficient because you are training individuals for an industry.

Mr. LYONS. The aggregate could be made, but I will put our pipefitters, for example, up against pipefitters trained by any other program. I do not think they are narrowly trained. They are totally broadly trained because we do not know what tomorrow will require in the plant. We couldn't afford to have them very narrowly trained.

So, no, I do not believe we have narrowly trained them.

Mr. HAWKINS. Do you retain those trainees or is there a rapid turnover?

Mr. LYONS. We have a relatively small turnover in our crafts people, that is true. Mostly it is retirements.

Mr. HAWKINS. Thank you.

Mr. Erlenborn.

Mr. ERLENBORN. Thank you, Mr. Chairman.

Let me explore a little further the time-based versus competency-based division. Where do the principal players come out in this debate—employers, unions, employees, professional trainers?

Mr. LYONS. In the first place, understand when we are talking about competency-based training, it is based on a very, very thorough task and job analysis, precisely what does this person have to do on the job. And it all starts with the job. Another term for it is criterion referenced instruction; namely, the criteria derived directly from the job. What is this person going to have to be able to do when they complete the training?

The whole system is based on the notion that having done that, having as thoroughly stated the job requirements that people will proceed to be certified in each part of the training just as rapidly as they demonstrate that they can do the job and that time is an irrelevancy.

It is our contention that—and this is not just based on my personal experience in industry. I did training research for the military services, contractor research for some 24 years before I joined Goodyear.

It is our contention that the individual is more thoroughly better trained, knows exactly what he is supposed to do; that the industry gets better people. Now, there is some objection, I believe—and I will let the people from other areas, from, say, unions, speak to that—there is some objection raised to changing the person's wage scale based on demonstrated competence as a procedure, rather than how much did they put on the job.

It is a somewhat antiseniority notion in training, I believe. As I say, I would rather let other people speak to that. But we know we do run into resistance from some people on this—some, I emphasize, not all.

As far as we can tell, everybody in the system gains from it. It is that simple. Because it has started with a demand that we know exactly what that person has to do when they finish the training. That may be the biggest advantage to it. We have defined what we want the people to do on the job when they get done.

Mr. ERLENBORN. I find your answer interesting. At first blush, one would think the employer would stand to gain if he could have this person there for many years at a low apprenticeship wage. And rather here, it seems as though you are the champion of moving them up to full journeyman status and wages that go with that at an earlier time.

Mr. LYONS. Absolutely; this is not altruism on our part. It is just a more efficient way of running a business.

Mr. ERLENBORN. My first impression would have been that the unions would have been much in favor of accelerating this because it would be to the advantage of the individual worker. But I think you do make a good point.

Mr. LYONS. I don't want to make a generalized statement about the union view on this because some of the finest competency-based programs in the country were developed strictly by unions.

Mr. ERLENBORN. So it is a mixed bag with the unions.

Mr. LYONS. And mixed bag with the companies, too, sir.

Mr. ERLENBORN. I guess you are all individuals. [Laughter]

Let me direct a question to Dr. Wells. Before I left a few minutes ago, I suggested an area of discussion that probably went on but I wasn't here. I don't know if you have had an opportunity to address it, and that is the relationship of education generally, vocational education specifically, with apprenticeship.

Mr. WELLS. Of course, vocational education is a partnership in the training of apprentices. In isolated cases they do have problems of participating. I don't think it is widespread. I think we have a pretty good relationship with the apprenticeship system.

We do have the expertise of producing entry-level persons for the apprenticeship program and we have a delivery system of teaching the related instruction to an apprenticeship program. You will, in any system, where it is large and involving as many partners and agencies into a system, you will have isolated cases of problems. But I think that we can work with the apprenticeship system, and in the end furnish a skilled worker that is useful.

Mr. ERLENBORN. Thank you.

Thank you, Mr. Chairman.

Mr. HAWKINS. Thank you.

Mr. GUNDERSON. Thank you, Mr. Chairman.

Let me see if I can summarize what has been said. Tell me if I am right or wrong. When we get into the business of reauthorizing the Vocational Education Act, as Mr. Griffin knows, there is in the proposal now before that subcommittee a bill which includes a number of different set-asides for particular specialized funding for particular specialized training. Apprenticeship, to my recollection, is not one of them.

Do I understand that what all of you are really saying is that throughout the Federal/State grant funds to States right now which some money can go into apprenticeship, the money is there if the States are willing to appropriate it for this program?

The problem isn't money as much as it is other regulations in the program such as the time-based element, such as some kind of academic credit for what is being done. The real challenge is in improving apprenticeship today are in these administrative regulatory sides of the apprenticeship program rather than some line-item authorization or appropriation for apprenticeship itself.

Is that right, wrong, or way off base?

Mr. LYONS. I would agree, unless there is money needed within the Department of Labor for administration for maybe training people within the Department of Labor in task and job analysis. This has been suggested that they could operate better if there were more training given to people within the Department. In a sense, you could call that administration money.

The industry, I don't think, is asking the Federal Government to fund apprenticeship training in any way, shape or form. So, I, in a sense, agree with you; yes, sir.

Mr. GUNDERSON. Yes?

Ms. WALTER. I think perhaps I would like to bring to your attention that at this point industry is providing a great deal of the technical training that is required for the new technologies that are here rather than the vocational schools. They are coming to our company and to other companies for us to provide not only the material, but the instructors, for these programs.

Certainly, I am in agreement that judging by competency, but in many of our apprenticeships, which are quite technical—I am talking about tool and dye, and wood pattern, which is now going into working with plastics, adhesives, and coatings—the training is much more extensive.

I would also like to point out that some of the union contracts limit companies to how many apprenticeships they can have in a particular field at a particular time, which also plays a part in how you design your training for your people.

And, yes; we do pay totally and we are not looking for funding. And we are always delighted for tax breaks.

Mr. GRIFFIN. In response, Congressman Gunderson, as you related to the Vocational Education Act, you are correct that no one—or, at least, we are not calling for a separate set-aside for apprenticeship training or anything like that. But we are calling for the Congress considering encouraging the coordination between the vocational education programs, greater involvement of business and industry as was indicated here. But to bring in the competency based throughout the language of that bill.

You will note, and I think it is section 306 in the bill that is currently before the committee, however, does encourage the Secretary of Education to try to find some way to better encourage cooperation in this arena by authorizing the funding of kind of an exemplary type program or demonstration kind of a program. It doesn't call it apprenticeship but it is based on the concept of apprenticeship. And cooperation with the vocational schools with consortia, business organized labor at the local level to take that vocational graduate and advance the level training situation. And it goes all way around saying apprenticeship.

But it is that kind of a concept that we would encourage that coordination through new legislation. We feel the encouragement is needed.

Mr. GUNDERSON. One final question. Do you all believe there is an adequate number of instructors out there for the apprenticeship, or is that a real problem today?

Ms. WALTER. If you are talking about people from within the companies, yes. If you are talking about the new technologies in the formalized school system, they, themselves, are searching and addressing this situation.

Am I making that clear?

Mr. GUNDERSON. Yes.

Ms. WALTER. Yes.

Mr. GUNDERSON. OK. Thank you, Mr. Chairman.

Mr. HAWKINS. Thank you.

Again, I would like to thank the witnesses: Dr. Wells, Ms. Julie Walter, Dr. Lyons, and Dr. Griffin. Thank you.

The next panel will consist of a State government panel: Mr. John Brooks, representing the National Association of Governmental Labor Officials, and Mr. Donald Grabowski, of the National Association of State Apprenticeship Directors.

Mr. Brooks and Mr. Grabowski, come forward, please.

The prepared statements that we have will be entered in the record at this point and we would appreciate the witnesses summarizing from the prepared statements. Mr. Brooks, we don't have a statement from you.

Let us begin, then, with Mr. Brooks.

## STATEMENT OF JOHN C. BROOKS, PRESIDENT, NATIONAL APPRENTICESHIP PROGRAM, ON BEHALF OF THE NATIONAL ASSOCIATION OF GOVERNMENT LABOR OFFICIALS

Mr. BROOKS. Thank you, Mr. Chairman.

I am John Brooks, the elected Commissioner of Labor in the State of North Carolina and chairman of the North Carolina Apprenticeship Council, and president of the National Apprenticeship Program.

And in addition to the hat that Mr. Don Grabowski wears as president of the National Association of State and Territorial Apprenticeship Directors, he is the vice president of the National Apprenticeship Program. So we are colleagues here today and we appreciate this opportunity.

I do want to express, first of all, my particular appreciation in behalf of the National Apprenticeship Program, to all of you, for these hearings and for this opportunity to appear before this subcommittee in the interest of apprenticeship.

I also want to thank you, Mr. Chairman, for addressing the national meeting of the National Association of Governmental Labor Officials this past summer. We appreciated your comments very much.

I have very extensive comments which are not completed, an with your permission, I will send them later for inclusion in the record. I do have a summary statement today.

Mr. HAWKINS. The record will be kept open for that reason.

Mr. BROOKS. Thank you, Mr. Chairman.

Apprenticeship, we do feel, is a very practical, effective, and cost-efficient mechanism for the training of the essential high-skilled workers in American industry and business.

It is my sincerest hope that Congress will act to amplify the ability of the apprenticeship system to meet our national needs for skilled workers to the end that we will once again become the world's leading competitor amongst the industrialized nations.

The National Apprenticeship Program is the cooperative effort of the National Association of Governmental Labor Officials that you addressed this summer, Mr. Chairman, the Organization of State Labor Commissioners and their counterparts, and the National Association of State and Territorial Apprenticeship Directors, the Organization of Government Agency Directors who organize, approve, certify, license, and promote professional apprenticeship programs; the president of whom is Don Grabowski.

The responsibility for promoting apprenticeship training has been principally that of State governments for many years. Thirty-two States and territories perform the tasks of determining which high-skilled crafts are apprenticeable in their respective jurisdictions and of registering those privately sponsored apprenticeship training programs that qualify.

As a State Commissioner of Labor and as president of the National Apprenticeship Program, I want to take this opportunity to call to your attention some concerns that I have about the Federal administration of apprenticeship training which arise from my daily observations of this program for the past 6½ years.

At the outset I want it to be understood that I am an advocate of an expanded role for formal apprenticeship training in the United States. Indeed, I am concerned that the Nation is not now pursuing a comprehensive manpower training program adequate to produce the high-skilled craftworkers needed today to sustain economic recovery nor that is needed in the near future to support the economic expansion.

In fact, today we are addressing one of the four horsemen bearing economic chaos. The four horsemen, of course, are the Federal annual deficit which is approaching $200 billion this year; the deficit balance of payments which continues to set new records each successive quarter; the default in international private lending institutions loans, and the dearth of high-skilled craftworkers.

The Federal Bureau of Apprenticeship and Training has been ineffective in recent years. Its current status is one of atrophy. The Bureau does not receive the support it needs and deserves either from the U.S. Secretary of Labor or the Assistant Secretary of Labor for Employment and Training.

Indeed, the Federal Apprenticeship Committee is totally ineffective as well, as you have heard from its previous chairman.

It is composed of persons representing the wrong interests, in light of its assignment. This is constantly reflected in the members' frustration. The Federal Apprenticeship Committee hasn't even met since June 1982.

The Federal Bureau of Apprenticeship and Training needs new and additional attention and support from the U.S. Congress. The Bureau should be separated completely from the administration of the JTPA and should be headed by an administrator of the rank of an Assistant Secretary of Labor.

Although the national apprenticeship program petitioned Assistant Secretary of Labor Albert Angrisani for a meeting with its officers at his convenience every 90 days while he was in the position of Assistant Secretary of Labor for Employment and Training, Mr. Angrisani never found the time for accommodating the first meeting. He always said that he was too busy with CETA and JTPA matters.

The Bureau's $15 million budget does not begin to accurately reflect the importance and magnitude of this program that is financed by $1 billion a year in private sector dollars, not Federal dollars.

This is not to say that the U.S. Congress should not appropriate more public funds in support of apprenticeship training, particularly its promotion and certification. Indeed, I believe that the Congress should appropriate additional public money in support of formal apprenticeship in each of the next several years.

But we are not here today for the purpose of outlining how many additional public dollars I perceive should be allocated to the promotion of apprenticeship through the U.S. Bureau of Apprenticeship and Training, but rather today, we want to address the most effective use of the public resources that are already appropriated to the U.S. Bureau of Apprenticeship and Training.

The U.S. Bureau will have 256 authorized positions at the end of fiscal year 1984, down from approximately 495 authorized positions in 1978.

The Bureau has recognized State-administered apprenticeship training programs in 32 States and territories that are termed the SAC States. Each of these programs is headed by a State Director of Apprenticeship and Training. Most of these Directors are furnished State staffs with which to operate State-administered apprenticeship programs as agents of the Federal Government.

In these same States and Territories, the U.S. Bureau of Apprenticeship and Training maintains a Federal State Director of Apprenticeship and Training, a secretary and, in most cases, additional field staff that is charged with exactly the same responsibilities as are principally assigned to the State programs as lead agencies in their respective jurisdictions. These federally furnished staff persons in these 32 States and territories are simply not needed.

What is needed includes the possible supplementation of the State staffs through the provision of Federal grants—possibly requiring State matching money—to the certified State and territorial apprenticeship programs; the development, production, and distribution of apprenticeship promotional materials; the development, production, and distribution of self-teaching audiovisual training materials to complement each recognized apprenticeable occupational craft; and the development, production, and verification of tests for the certification of skill attainment in the pursuit of competency-based apprenticeship training.

Support for the development of an expanded formal apprenticeship program throughout America requires the deliberate pursuit of job analyses and the manufacture of related-instruction materials for each apprenticeable craft in the next few years.

This has been done for a small number of the 800 apprenticeable occupations thus far at a cost of approximately $2 million per craft. This need should be responded to by the U.S. Congress with major appropriations to the U.S. Bureau in each of the next several years until this job is completed.

The existing resources of the Bureau should be redirected to this effort immediately. However, I recognize that this will not happen unless the Congress directs that this be done.

I recognize the interests of those U.S. Bureau staff members who reside in the various SAC States. Many of them are not interested in moving and many may not be qualified to pursue the alternative activities that I advocate for the U.S. Bureau of Apprenticeship and Training.

What can be done immediately is for the Bureau to adopt a policy of not filling any vacancies arising in its staff within any of the SAC States and territories. There are now many vacancies, and were even more a few months ago.

However, unfortunately, with the lifting of the Federal freeze on hiring, the Bureau is moving, and has moved quickly to fill these unneeded positions. And this is sad.

[The prepared statement of John C. Brooks follows:]

## PREPARED STATEMENT OF JOHN C. BROOKS, ELECTED COMMISSIONER OF LABOR, STATE OF NORTH CAROLINA, CHAIRMAN, NORTH CAROLINA APPRENTICESHIP COUNCIL, PRESIDENT, NATIONAL APPRENTICESHIP PROGRAM

First I want to express my appreciation and that of the National Apprenticeship Program to you for these hearings and for this opportunity to appear before the subcommittee in the interest of apprenticeship. Apprenticeship is a practical, effective, and cost efficient mechanism for the training of the essential high skilled workers in American industry and business. It is my sincerest hope that Congress will act to amplify the ability of the Apprenticeship system to meet our national needs for skilled workers to the end that we will, once again, become the world's leading competitor amongst the industrialized nations.

### THE NATIONAL APPRENTICESHIP PROGRAM

The National Apprenticeship Program is the co-operative effort of the National Association of Government Labor Officials (the organization of state labor commissioners and their counterparts) and the National Association of State and Territorial Apprenticeship Directors (the organization of government agency directors who promote, organize, develop, register, and certify professional apprenticeship training has been principally that of state governments for many years. Thirty-two states and territories perform the tasks of determining which high-skill crafts are apprenticeable in their respective jurisdictions and of registering those privately sponsored apprenticeship training programs that qualify.

### APPRENTICESHIP

Apprenticeship is the age-old custom of training high-skill craftsmen by indenturing an apprentice (a trainee) to a journeyman craftsman in his chosen trade or to an employer who in turn employs a journeyman. The employer promises to train the apprentice, through on-the-job experience and related instruction, in all the skills and knowledge about the particular craft. Apprenticeship training recognizes the essential requirement that a journeyman achieves proficiency in his craft, not just a mastery of the knowledge and theory about the craft.

Apprenticeship in the United States is a totally voluntary system of training. The sponsors elect to sponsor a program to train their most highly skilled workers, and the apprentices elect to be trained through apprenticeship.

There are about 800 apprenticeable occupations currently recognized in the employment community of the United States.[1] Apprenticeable occupations traditionally include silver and gold smithing, the eighteen building industry trades (such as carpentry, plumbing, and electrical work), and the industrial manufacturing trades (such as tool and die makers, machinists, and boiler makers). More recently recognized apprenticeable occupations include several in the allied health sciences where for example an apprentice can learn to become a laboratory technician, X-ray technician, or an industrial hygienist. The range of apprenticeable occupations is all-encompassing of the high-skill crafts. Diamond cutters, airplane jet-engine mechanics, diesel engine mechanics, elevator mechanics, loom fixers, computer programmers, and deputy sheriffs can all learn their trade through apprenticeship.

In 1937 the Congress enacted the Fitzgerald Act [2] which established the basis for a formal apprenticeship system in the United States. The Act is short, vague, and general. A significant labor-force training program, nevertheless, has been developed within the parameters of this legislation during the forty-six years of its enactment. The current federal apprenticeship program, however, reflects the strains resulting from the Fitzgerald Act's vagueness. There is an urgency for the Act to be amended or replaced with legislation that establishes a more definitive federal apprenticeship program capable of producing the number of journeymen craftsmen needed by industry as we attempt to revitalize our economy during the remainder of the twentieth century.

New legislation should specifically provide for a national system of determining apprenticeable occupations and for the establishment of uniform minimum standards and criteria for each recognized craft. Apprentices should not be forced to acquire their related instruction from expensive correspondence courses of questionable quality or from proprietary material that is not generally available. Access to propriety materials is oftentimes contingent upon the condition that the apprentice either work for an exceptionally large employer or belong to a prescribed labor union, or both. New legislation should provide for the federal government to design, manufacture, and distribute related-instruction materials for each of the recognized apprenticeable trades.[3] For most trades there should also be produced a self-instruction audio-visual curriculum of related-instruction material. These instruction materials should be available to the public at very modest purchase and/or rental prices.

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[1] The "Dictionary of Occupational Titles" lists 24,000 jobs performed in the United States (Ray Marshall and Ernest G. Green, "Dictionary of Occupational Titles," 4th ed. [Washington, D.C.: U.S. Department of Labor, 1977]).

[2] A copy of the Fitzgerald Act is attached as app A. At the time that the Fitzgerald Act was enacted, the Congressional Record for the House (1937) shows that the expenditure of $56,900 to operate the system was contemplated. The immediate preceding issue was the funding of a monument to Will Rogers in the amount of approximately $500,000, which was approved without debate.

[3] At the time that the Congress was considering the enactment of the Fitzgerald Act in 1937, the U.S. Department of Labor and the U.S. Office of Education sent a "Joint Memorandum to the chairman and members of the Subcommittee on Appropriations for the Department of Labor, House of Representatives," a copy of which is attached as Appendix B, which stated in pertinent part:

"[T]here are two distinct groups of responsibilities and functions in the promotion and subsequent operation of plans for apprentice training. One group deals with the apprentice as an employed worker—the conditions under which he works, his hours of work, his rates of pay, the length of his learning period, and the ratio of apprentices to journeymen so that overcrowding or shortages of skilled workers in the trades may be avoided in large part. The second group of responsibilities deals with the apprentice as a student—the related technical and supplemental instruction needed to make him a proficient worker and the supervision and coordination of this instruction with his job experience."

The memorandum contemplated a cooperative relationship between the U.S. Department of Labor and the U.S. Office of Education in behalf of a formal apprenticeship. In the forty-six years since the enactment of the Fitzgerald Act the contemplated relationship has failed to materialize and the Office of Education, now Department of Education, has yet to develop any curricula that complements formal apprenticeship. Nor is there any evidence that the U.S. Department of Labor has ever initiated any invitation to the Office of Education to assist in any way in promoting quality apprenticeship.

New legislation should also provide for the development and validation of competancy examinations for each apprenticeable skill. The legislation should also provide for the development, manufacture, and distribution of promotional materials for each trade.

This legislation should become one of the cornerstones of a deliberately promulgated national manpower development strategy and program.

### APPRENTICESHIP UTILIZATION

The low level of utilization of apprenticeship in the United States is a major contributor to the continuing problems of the nation in meeting competition for world markets. As an example, while the United States presently registers less than 300,000 apprentices in all age groups, one of the United States' most effective competitors, Germany, registers approximately 628,000 apprentices in just the 16- to 18-year age range, which is approximately one-half of the German citizens in that age range. If North Carolina, alone, registered a proportionate number of 16- to 18-year olds as apprentices, there would be at least 170,000 apprentices in the State.

In North Carolina there are presently approximately 1,350 of these voluntary sponsors of apprenticeship training and about 2,550 registered apprentices in training. It appears that there is a need in North Carolina alone for training opportunities to be in place for at least 20,000[4] apprentices if the State is to meet the most minimal needs for skilled craft workers in the immediate future.

Most of the industrialized nations with which the United States competes for international markets provide either significant incentives to operate apprenticeship programs or significant penalties for failure to operate apprenticeship programs. At present the only instance of such incentives that are in effect in the United States is the Davis-Bacon Act which provides wage incentives to contractors doing business on federally funded construction projects. Not even the new Jobs Training Partnership Act provides any realistic opportunity for an employer to recover a significant portion of the training investment for apprentices through government support. Clearly, there is a substantial need for incentives to encourage the private employer to take action to train the highly skilled craft and trades workers that the United States needs in order to be an effective competitor in the international marketplace.

### MEETING THE NEEDS OF THE NATION'S ECONOMY

Today we are addressing one of the four horsemen bearing economic chaos. The four horsemen, of course, are the federal annual deficit which is approaching 200 billion dollars this year, the deficit balance of payments which continues to set new records each successive quarter, the default in international private lending institution's loans, and the dearth of high skilled craftworkers.

An unrecognized cause of inflation is the growing scarcity of the nation's high-skill labor force. Although the United States continues to produce a steady supply of journeyman craftsmen, it is also producing an expanding work force amidst a second industrial revolution. Micro-electronic computerized robots are replacing many unskilled workers. (Unskilled workers are those persons who have less than six months of specific training for the tasks required by their jobs and/or who have less than a high-school equivalent education including reading, writing, and mathematics). While the unskilled workers in an expanding population experience increased difficulty in finding a job, those few trained in newly developing occupations are in great demand, thereby commanding higher wages. Increasing the number of skilled craftsmen will moderate labor's wage demands while also reducing unemployment.

Apprenticeship programs offer relief for the vicious economic cycles that have plagued this country in recent years. Even during prosperity the nation has a base workforce of 10,000,000 people who lack marketable skills in today's economy. Add to this figure the number of persons who are displaced because of the current recession and also those persons who lose jobs because of the new industrial revolution and the result is an economic crisis. Until the federal and state governments recognize this problem and implement programs capable of remedying the situation, continued cycles of inflation, recession, and possibly depression are in store for the nation.

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[4] Attached as app. C is a news release of the N.C. Department of Labor setting forth "Anticipated Annual Average Job Openings for (39) Priority Occupations" for 1983–90. In only the 25 apprenticeable occupations reflected in this one analysis there are anticipated to be some 27,266 new job opportunities in North Carolina annually.

Inflation results from the operation of the "free-enterprise," "demand and supply" theory. While the theory is old, it still works. When the demand for goods and services cannot be met by supply because there are insufficient craftsment to fill the critical ten to twenty percent of the jobs found in most industries, the wages or salaries of those who possess the required skills are bid up. This is precisely what has occurred in the United States in recent years and what is also likely to occur during the remainder of this decade.

For the past five years, the nation's high-skill craftsment have demanded and received wage increases of approximately 25 percent to 30 percent per year—this is nearly three times the national rate of inflation. In fact, these increases are, and will continue to be, one of the causes of inflation. Today's high-skill labor force is at near full employment just as it has been for the last forty years. Skilled labor in all probability will continue to enjoy this status at least for the rest of this century. Thus, it is critically important that the United States put into place a high-skill training program capable of dramatically increasing the numbers of journeymen-level craftsment in the nation's work force.

In an excellent study of the United States' manpower development programs and lack of national manpower development policy and strategy, Dr. Robert Taggart writes in his monumental work "A Fisherman's Guide: An Assessment of Training and Remediation Strategies" as follows:

"It is human nature to neglect and squander resources which are plentiful. It is also human nature to react with alarm and surprise when these same resources later become scarce and valuable. For decades, our nation has had a surfeit of unskilled and entry workers, the result, first, of rising agricultural productivity and rural migration, and, subsequently, of increased female labor force participation and the coming of age of the post-war babies. Because these human resources were plentiful, they have been wasted and disdained. As a nation, we have concentrated our investments on higher education and advanced levels of preparation for those best able to compete in and contribute to the labor market. Persons of limited employability have been provided income maintenance, makework, and remedial band-aids in order to assure minimum well-being and to buy social peace.[5]

Dr. Anthony Patrick Carnevale, writing in "Human Capital: A High Yield Corporate Investment" in 1982,[6] wrote:

"[W]hile we have learned to value people for their purchasing power, we have not seen them as critical resources for production.

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"Unfortunately, our misconceptions and the biases of our recent history are threatening our nation's economic future.

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"We cannot compete for low wage, low skill production markets.

"Our real competitors are the other, 'more developed' countries. As the pace of technological change accelerates, competitive advantage depends on our ability to adapt, to apply new technologies to production and to integrate human skills with new machine technology. Adaption will be all the more difficult as product life and skill life become shorter and shorter. Ultimately it is the rate at which we apply new technologies and integrate them with ready labor that will determine our success. As the international rationalization process accelerates, the constant and optimal shifting of human and machine resources will be required, as will the constant retraining of the workforce."

In and address before the Southeastern Atlantic Coastal States Regional Conference sponsored by the American Council on Education Commission of Higher Education and the Adult Learner, C. C. Cameron, chairman of the board of the North Carolina Citizens for Business and Industry, "The Voice of Business," stated the forecast as follows:

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[5] Report Taggart, "A Fisherman's Guide: An Assessment of Training and Remediation Strategies" [Kalamazoo, Michigan (300 South Westnedge Avenue, 49007): The W. E. Upjohn Institute for Employment Research, 1981], p. vii.

[6] Anthony Patrick Carnevale, "Human Capital: A High Yield Corporate Investment" [Washington, D.C. (600 Maryland Avenue, S.W., Suite 305, 20024): American Society for Training and Development, 1982], pp. 1 and 6.

"Enlightened businessmen believe they will have to retrain their employees every four to five years. Some say we are on a four-year technological obsolescence cycle, down from the 10-year cycle it was at about 15 years ago." [7]

Dr. Carnevale continues his assessment of the situation by saying that:

"The economic effects of population decline are already upon us. Overall shortages of workers are hidden, however, under the cloak of the current high rates of unemployment. Recovery will reveal this overall shortage quickly and dramatically. In the 1970s, for instance, even the slower rates of growth produced 19 million new jobs for new workers. As the effects of population decline begin to impact in the 1980s, there will be only 16 million new workers. If the eighties achieve even the middling rates of economic growth characteristic of the seventies, the economy will generate a minimum of 19 million new jobs, creating a gap of 3 million jobs for which there will be no workers.

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"The long view of economic history teaches us that people are the master economic resource. They are the master resource because they use their acquired skills and abilities as the catalytic agents that combine tangible elements and intangible ideas to make machinery and usable goods and services. In spite of that fact, there is a great temptation for employers to ignore the long term value of human investment. This is especially true in times such as these when investment capital is short and unemployment lines are long. Secondly, in the short term, individual employers are faced with the prospect of losing their investment in people. Employees are mobile and machinery is not. When one employer invests in training and development, another can invest in wages and pirate employees at the completion of their training. Lastly, when jobs are in short supply, there is an equally great temptation to rely on a quantity of cheap labor rather than a quality few. With jobs available for only one in ten unemployed workers, it is indeed a buyer's market.

"Although employers generally appreciate the longer term yield of current investment in human resources, the press of daily business and the realities of the labor market encourages them to win their share of the nation's skilled workers through wage bidding and not through human resource development. We, as a nation of employers, have been going to the well for some time for skilled workers without replenishing the source of supply. As a result, the long term finally is arriving as evidenced in a spate of statistics that suggest mounting skill shortages, reduced overall quality in the American labor force, shoddy workmanship, unsatisfactory maintenance and wages which are not balanced by worker productivity. Further, attempts to improve productivity by increasing machine capital are proving costly and are resulting in protectionist resistance among current workers who are concerned for their own job security. Individual firms that once found it profitable to buy skilled workers by bidding up demand now find the price high, the supply short, and the quality low. What was good for individual employers has proven costly for all.

As a society, we will have to discover new mechanisms for employers to realize the longer term benefits of employee training and human resource development. Public incentives that place investment in human resources at least on a par with investment in machinery will help. Fe[illegible]operated training programs for skill shortages which do not have the accou[illegible]y of the workplace will only be marginally effective. In the final analysis, resolution of the problem depends on the willingness of employers to look beyond the short term economic dynamics that discourage human resources investment. In the absence of employer-based strategies, however, public programs and regulations are inevitable." [8]

The report of The Preparatory Conference on Private Sector Initiatives, for the White House Conference on Productivity, summarizes the outlook as follows:

"The pace of economic change, the current investment incentive structure, the structure of American industry, demographic changes and repeated recessions suggest that the United States is currently underinvesting in job related training. Additional incentives are required to encourage greater commitment to job training and career development among employees and employers." [9]

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[7] C. C. Cameron, "Higher Education and the Adult Learner: A Businessman Responds" [Speech presented to the Southeastern Atlantic Coastal States Regional Conference sponsored by the American Council on Education Commission on Higher Education and the Adult Learner, Raleigh, North Carolina, Oct. 26, 1983]. (C. C. Cameron is chairman of First Union Corporation, a banking institution, Charlotte, North Carolina.)

[8] Carnevale, pp. 1 and 6.

[9] White House Conference on Productivity. "Report of the Preparatory Conference on Private Sector Initiatives. Pittsburgh, Pa., August 2-4, 1983." [Washington: The White House, 1983], p. 59.

## THE IMPACT OF A HOUSING SHORTAGE ON THE ECONOMY AND MEETING THE NEEDS OF AN INDUSTRY—THE HOMEBUILDING INDUSTRY—FOR MORE CRAFTSMEN

When the housing industry experiences a slowdown, one hardly thinks about the industry's future need for skilled tradesmen or about the serious shortage of adequate housing that now exists, yet a crisis of grave dimensions in the home-building industry is in the making. In 1981, the home building industry constructed 900,000 units of housing—single family, apartments condominiums, and attached dwellings—to accommodate the "expressed" demands of Americans for some place to live. Unfortunately, this figure represented less than 50 percent of the supply needed (2,000,000 units) to meet the demand for new housing units each year. In 1982, the home building industry constructed some 1,100,000 units of housing. In 1983, the nation will probably realize another 1,100,000 units of housing. When the unmet demand for 1981, 1982, and 1983 is added to the unmet demand from preceding years (approximately 5,500,000 housing units), the resulting figure of 8,500,000 unbuilt housing units poses a significant problem that increases each suceeding year. In prosperous times the nation's homebuilding industry work force, at full employment, is capable of building housing units at the annual rate of 2,000,000 units. Of great importance is the fact that this figure equals the annual demand for new housing units only. Therefore, even at full employment, the construction industry is incapable of reducing the chronic shortage of housing that exists in the United States.

Where has the housing "demand" been? Where was this "demand" in 1981, 1982, and 1983? The "demand" for housing units has been suppressed by high interest rates and by inflation. Typically, buyers enter the housing market when they perceive interest rates to be affordable or at a periodic low. While inflation has decreased to under five percent, real interest has continued to increase and is now almost four times as much as it was when President Reagan took office. The result has been a continued suppression of the home building industry.

The construction industry can meet an increased demand until the number of units being built equals about 2,000,000 units a year. When "expressed demand" exceeds that figure, prices of homes and real estate will again increase sharply because there will be more buyers than there are new housing units. This predictable inflation in real estate and housing will generate inflation throughout the economy. In particular, the wages of home building craftsmen will surge upward as the shortage is recognized, outstripping the national rate of inflation.

Wages and salaries of craftsmen in the home construction industry increase an average of twenty-five to thirty-five percent per year in high demand years. As home buyers are forced to borrow ever larger sums of money, real interest rates will be pushed even higher as home buyers compete with the federal government, foreign governments, and business for available capital. As real interest rates increase, the "expressed demand" for new housing will decrease and construction workers will be laid off eventually and not recalled until real interest rates drop significantly. When buyers re-enter the housing market, interest rates and construction wages again will be driven higher than they were in the previous cycle.

Part of the solution to this cyclic problem must include an expanded partnership between government and business to train a work force capable of accommodating an expanding homebuilding industry. A significant part of this partnership must include expanding formal on-the-job training through apprenticeship. The skills of the working journeyman must be harnessed by an expanded training program to prepare the building tradesmen who will be needed in the near future.

Another part of the solution to this cyclic problem is the establishment of a federal program to stabilize the housing industry and the housing market. One component of such a program would be the elimination of vast fluctuations in the demand for craftsmen in the home building industry. By stabilizing demand, many craftsmen who are routinely permanently lost to the industry during periods of low consumption, would not only be retained, but would develop even greater skill and proficiency. A full description at a proposed federal housing industry stabilization program is contained in Appendix D.

## AN EXAMPLE OF THE IMPACT OF A CRAFTSMEN SHORTAGE ON AN INDUSTRY AND THE NEED FOR MORE ELEVATOR INSTALLERS AND MECHANICS

Conditions in the elevator industry present a glaring example where the nation is paying dearly for having an inadequate high-skill labor force. Although the nation continues to experience a recession in the home building industry, the elevator industry is at "full" employment. In fact, the backlog of orders for installations of new elevators is so staggering that the industry has been forced to rehire previously terminated employees, postpone scheduled retirements, and extend the work week just to keep up with the demand for more elevator mechanics. Journeymen elevator mechanics are spread as thinly as possible to maximize the number of teams installing new elevators.

Few journeymen elevator mechanics are being trained in the United States today. The nation is riding on the backs of the elevator work force trained in yesteryear. There is no public institutional curricula for training elevator mechanics anywhere in the country. If meeting construction demands is difficult today, where will the elevator industry be when a recovery in the building industry takes place? If the "demand" for new high-rise buildings increases during economic recovery, there will be unavoidable delays in completion of these buildings due to the insufficient supply of elevator mechanics. As a result, construction costs will increase, thus fanning even more the fires of run-away inflation.

An important part of the solution to this problem must be the inauguration of a partnership between the government and private business to immediately establish a formal apprenticeship program for the on-the-job training of elevator mechanics.

Even this important step will not be without its problems because many journeymen elevator mechanics are unfamiliar with new solid-state technology that is revolutionizing the elevator industry. This added complexity only increases the national urgency for proceeding now with establishing high-quality training programs capable of producing journeymen elevator mechanics in significant numbers.

### MEETING THE NEEDS OF INDIVIDUAL MEMBERS OF THE WORK FORCE FOR JOB TRAINING

In recent years most training and remediation for persons of limited employability has been provided under the aegis of the Comprehensive Employment and Training Act (CETA). JTPA and now apparently is to be provided under the aegis of the Job Training Partnership Act (JTPA). JTPA allocates federal funds to state and local governments for classroom and on-the-job training, as well as for job creation and other activities. Job Corps is a nationally-operated residential training program for young adults also authorized by JTPA.

It is striking how little this nation commits to improving the employability of those at the end of the labor queue. Under CETA in 1980, there were 700,000 new participants in institutional or on-the-job training, representing just 4 percent of all those who experienced unemployment during the year, a miniscule .6 percent of all persons in the labor force, and less than a tenth of all persons in the labor force at least half the year whose earnings, when combined with those of other family members, fell below the poverty level.

Again Robert Taggart sets forth an astute evaluation of how well the CETA program met the needs of individual members of the work force for job training in his monumental study, "A Fisherman's Guide: An Assessment of Training and Remediation Strategies." Some insightful quotations are set forth below.[10]

"[T]he primary emphasis of CETA has been to provide jobs rather than training, and a helping hand rather than substantive remediation or career ladders. Three-fourths of all local CETA allocatons in 1980 were used for subsidized employment rather than training or transition services. Less than one in fifty terminees from local programs were graduates of more than a year's training.

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"CDTA's planning, budgeting, record-keeping, decision making and management approaches for local programs evolved to accomplish short-term palliative missions; they discourage training investments and undermine training quality.

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"For a disadvantaged individual to attain a high school equivalency or post-secondary training degree, or to learn almost any occupational skill, takes substantially more time than the average duration of CETA training. Only a small minority of participants are assigned to training that is long enough to provide credentials and competences that will help to feed them for a lifetime. Perhaps only a few in a hundred participants have the endurance or capacity for the one-, two- or even four-year training, but it is critical to begin providing opportunities for this minority to achieve 'quantum leaps' in employability.

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[10] Taggart, pp. viii, ix, x, 9, and 10.

"Uniform, federally-mandated competency assessment systems should be adopted to measure academic and vocational skill acquisition, to organize individualized, self-paced instruction, to judge the effectiveness of training institutions, and to certify competencies attained.

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"Residential 'corporate career' training and internship programs operated by private sector corporations and associations in their own training facilities should be developed at the national level, with opportunities available equally to all in need who prove their commitment and capacity.

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"Training requirements for career entry jobs in our economy need to be formalized through an expanded and more flexible apprenticeship system.

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"CETA is now essentially a 'one-shot' intervention rather than an employability development system. The participant enters the door, is assessed, assigned to a limited duration component, and then (sometimes) placed in a job on completion. What is needed is an opportunity ladder which individuals will mount and scale at the level and pace dictated by their ability and motivation. This, in turn, requires a system for measuring competencies and competency acquisition. It requires standards of completion as well as qualitative standards for inputs. Most of all, it requires that these standards be maintained.

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"[M]ore sorting must be done among those in need. The labor market's leftovers include individuals of widely-ranging potential, and too little is now done for those who have greater ability and motivation.

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"If a second tier of advanced opportunities were added to what now exists in CETA, no one who exerted an effort would get less than under the current system, but those who exerted more effort and had more potential could advance substantially. Alternatively, the second tier might be financed by savings which could be achieved under current programs if they were focused solely on training rather than functioning as stopgaps for persons with no other options. Allowances in classroom training and wages in on-the-job training should be used as a means to reward performance, to cover the extra costs of participation, and to meet only the poverty deficits which would hinder participation, rather than providing an incentive to participate even when there is no desire to be trained. There is room for some savings in this regard, probably enough to finance longer training for a reasonable proportion of current trainees. But a tradeoff is inherent: Fewer individuals can be served when longer training is provided with any given a level of resources. While the net result of adding a second tier of opportunities will be greater average and aggregate impacts for those in need, the benefits will be less broadly shared. This is only equitable if the opportunity structure is established so that all participants have an equal shot at the longer and more promising training opportunities.

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"Some changes are needed in law, regulations, program design, and management in light of these findings, but the bigger challenge is to alter thought processes which have guided manpower programs and policies for years. We must begin thinking about long-term impacts and 'quantum leaps' not just immediate outcomes and marginal gains. A stable training system is needed rather than an ever changing array of separate training programs. There must be long-term strategies, both locally and nationally, for building a range of new opportunity tracks for disadvantaged individuals with potential. Quality, not just quantity, needs to be emphasized in curricula, in staff, and in outcomes. The employment and training system must, in every way possible, utilize existing institutions rather than maintaining segregated and frequently second-class delivery approaches for the disadvantaged.

"Even with such changes, the potential of training efforts for persons of limited employability will be circumscribed unless the institutional setting is altered. As long as there are disincentives for training by the private sector, as long as the competencies and training needed to fill available jobs in the economy are uncertain, and as long as help is offered to persons of limited employability as an act of 'noblesse oblige,' public programs will continue to have difficulty determining and meeting private sector needs, private employers will stay at arm's length, discounting the quality of training, and public resources will remain inequitably distributed and overly concentrated on advanced education even though entry-level investments would yield more payoff in the expected labor market of the next two decades. Some of the long-term options which need to be considered are, first, a GI-Bill approach to career training and education, where all individuals would be guaranteed two years of postsecondary training or retraining to be purchased from public and private institutions by voucher; second, employer and employee taxes to cover part of the costs of this career training, with credits where the private sector provides the training itself, in order to encourage more entry training; and third, expansion of the apprenticeship system to formalize the career entry tracks and to identify the competencies and training necessary to perform career entry jobs in our economy."

### FEDERAL ADMINISTRATION OF APPRENTICESHIP

As a state commissioner of labor and as president of the National Apprenticeship Program, I want to take this opportunity to call to your attention some concerns that I have about the federal administration of apprenticeship and training which arise from my daily observations of this program for the past six and a half years. At the outset I want it to be understood that I am an advocate of an expanded role for formal apprenticeship training in the United States. Indeed, I am concerned that the nation is not now pursuing a comprehensive manpower training program adequate to produce the high-skilled craftworkers needed today to sustain economic recovery, nor those needed in the near future to support economic expansion.

The federal Bureau of Apprenticeship and Training has been ineffective in recent years. Its current status is one of atrophy. The Bureau does not receive the support it needs and deserves either from the U.S. Secretary of Labor or the Assistant Secretary of Labor for Employment and Training. Indeed, the Federal Apprenticeship Committee is totally ineffective as well. It is composed of persons representing the wrong interests, in light of its assignment. This is constantly reflected in the members' frustration. The Federal Apprenticeship Committee hasn't even met since June, 1982. It should be reorganized to include 25 members: five from management; five from labor, five from among the state labor commissioners; five from the state apprenticeship agency heads, and five from the public at large.

The federal Bureau of Apprenticeship and Training needs new and additional attention and support from the U.S. Congress. The Bureau should be separated completely from the administation of the Job Training Partnership Act (JTPA) and should be headed by an administrator of the rank of an Assistant Secretary of Labor. Although the National Apprenticeship Progam petitioned Assistant Secretary of Labor Albert Angrisani for a meeting with its officers at his convenience, every 90 days while he was in the position of Assistant Secretary of Labor for Employment and Training, Mr. Angrisani never found the time for accommodating the first meeting. He always said that he was too busy with CETA and JTPA matters.

A serious problem facing the Bureau of Apprenticeship and Training is its need for additional funding. Ironically, this need exists while the Employment and Training Administration (the organizational unit to which the Bureau is attached in the U.S. Department of Labor) is being administratively overwhelmed by the billions of dollars that it must administer under JTPA legislation, and in past years under CETA legislation. Although the Employment and Training Administration passes the bulk of its JTPA funding to to prime and balance-of-state sponsors (who in turn distribute project grants and stipends on to subcontractors and recipients), the sheer magnitude of administering this multibillion dollar[11] program has skewed all activity in the Employment and Training Administration toward the JTPA program. The

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[11] The following totals reflect the amount appropriated for the CETA and JTPA programs over a six-year period. The amount listed under fiscal year 1984 is a 21-month total, Oct. 1, 1983 through June 30, 1985, reflecting the beginning of a two-year new-fiscal year grant cycle for JTPA.

| Fiscal year: | *Appropriation* |
|---|---|
| 1979 | $10,295,365,000 |
| 1980 | 8,127,626,000 |
| 1981 | 7,525,831,000 |
| 1982 | * 3,031,844,000 |
| 1983 | 4,006,702,000 |
| 1984 | 6,419,408,000 |

* This amount is low because $1,000,000,000 appropriated in fiscal year 1981 was carried forward into fiscal year 1982, reducing the need for additional appropriations.

Bureau of Apprenticeship and Training, with its budget of $15 million dollars,[12] has been completely overshadowed in terms of priority and resources. If apprenticeship promotion is to expand, the Bureau of Apprenticeship and Training needs greater visibility and influence within the U.S. Department of Labor.

The Bureau's $15 million budget does not begin to accurately reflect the importance and magnitude of this program that is financed by $1 billion a year in private sector dollars, not federal dollars.

The actual cost of apprenticeship training in the United States is largely borne by private employers. For this reason it is difficult to determine how much money private industry is spending on apprenticeship, but the figure is estimated by some to be several times larger than the federal JTPA budget.[13] Since both JTPA and apprenticeship programs have training as their ultimate objective, isn't it more economical for the government to allocate more public funds to promote apprenticeship programs?

The congress should appropriate additional public money in support of formal apprenticeship in each of the next several years. Rather than for me to try to propose exactly how many dollars should be appropriated by the Congress for an expanded apprenticeship program in each of the next several years, I want to address problems surrounding the most effective use of those public resources already appropriated to the U.S. Bureau of Apprenticeship and Training.

The U.S. Bureau will have 256 authorized positions at the end of fiscal year 1984, down from approximately 495 authorized positions in 1978. The Bureau has recognized state-administered apprenticeship training programs in 32 states and territories (SAC states). Each of these programs is headed by a state-employed state director of apprenticeship and training who has the full authority and responsibility for directing all government apprenticeship programs in that respective jurisdiction. Most of these directors are furnished state staffs with which to operate state-administered apprenticeship programs as agents of the federal government. In these same states and territories the U.S. Bureau of Apprenticeship and Training also employs a "state director of apprenticeship and training," a secretary, and, in most cases, additional field staff that is charged with exactly the same responsibilities as are principally assigned to the state programs as lead agencies in their respective jurisdictions. These federally-furnished staff persons in these 32 states and territories are simply not needed, and there is no viable justification for the continued expenditure of federal funds for their employment.

What is needed includes the possible supplementation of the state staffs through the provision of federal grants (possibly requiring state matching monies) to the certified state and territorial apprenticeship programs; the development, production, and distribution of self-teaching audio-visual training materials to complement each recognized apprenticeable occupational craft; and the development, production, and verification of tests for the certification of skill attainment in the pursuit of competency based apprenticeship training. Support for the development of an expanded formal apprenticeship program throughout America requires the deliberate pursuit of job analyses and the manufacture of related-instruction materials for each apprenticeable craft in the next few years. This has been done for a small number of the 800 apprenticeable occupations thus far at a cost of approximately $2 million per craft. This need should be responded to by the U.S. Congress with major appropriations to the U.S. Bureau in each of the next several years until this job is completed.

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[12] Federal budget for Bureaus of Apprenticeship and Training for fiscal year 1981 was $15,737,000; for fiscal year 1982 was $15,737,000; for fiscal year is $15,369,000; and for fiscal year 1984 will be $14,856,000.

[13] "Expenditures for private vocational and technical school training in 1980 were an estimated $1.8 billion with some of this subsidized by public funds, particularly under the veterans' training programs, and much of it beyond the means of persons with limited earnings and income. The estimates of formal training and education financed by industry are not very dependable, but a best guess is that between $5 billion and $8.5 billion were spent in 1980, excluding the wage and salary costs for training during work hours." Taggart, p. 7.

"Many companies are investing large amounts on training and development of their employees. Some training budgets rival the R&D budgets of companies." Cameron.

Dr. Anthony Carnevale estimates that employers are investing more than $30 billion annually in formal employee training. Carnevale, p. 3. Also, White House Conference on Productivity. "Report of the Preparatory Conference on Private Sector Initiatives, Pittsburgh, Pa., August 2-4, 1983." [Washington: The White House, 1983], p. 57.

"Private enterprises are now spending between $10 and $15 billion a year on training costs, and if the costs of employees salaries are included in these estimates they aggregate to $21 billion." White House Conference on Productivity. "Report of the Preparatory Conference on Human Resources, St. Louis, Mo., June 21-23, 1983." [Washington: The White House, 1983], p. 4.

An expanded federal apprenticeship program desperately needs to furnish the states with promotional materials—literature, supporting letters and T.V. spots for the apprenticeable crafts. A promotional campaign not unlike the campaign conducted by the armed forces is needed for recruiting young persons into apprenticeable occupations.

The existing resources of the Bureau should be redirected to these efforts immediately; however, I recognize that this will not happen unless the Congress directs that this be done. I recognize the interests of those U.S. Bureau staff members who reside in the various SAC states. Many of them are not interested in moving and many may not be qualified to pursue the alternative activities that I advocate for the U.S. Bureau of Apprenticeship and Training. What can be done immediately is for the Bureau to adopt a policy of not filling any vacancies arising in its staff within any of the SAC states and territories. There are now many vacancies. However, unfortunately, with the lifting of the federal freeze on hiring, the Bureau is moving quickly to fill these unneeded positions. This is sad.

I appeal to you for your assistance in redirecting the activities and resources of the U.S. Bureau of Apprenticeship and Training and in obtaining the resources that this vitally important program requires.

### AN ADEQUATE NATIONAL APPRENTICESHIP PROGRAM

A comprehensive national apprenticeship training program should include: (1) a nationwide determination of all apprenticeable occupations; (2) the establishment of precise training standards for each apprenticeable occupation; (3) the provision of government-developed instruction materials, including competency-based training modules, for all apprenticeable occupations; (4) the provision of validated competency-determinable examinations for each skill; (5) certification of journeymen and related-instruction instructors; (6) the provision of employer and employee promotional materials; (7) financial and training assistance to state agencies that certify apprenticeship programs; (8) relieving apprenticeship agencies of the responsibility for enforcing Equal Employment Opportunity requirements; (9) tax incentives for employers to encourage them to develop apprenticeship programs; and (10) membership of apprenticeship management professionals on manpower-development advisory boards and planning commissions.

### STATE APPRENTICESHIP PROGRAMS

In addition to reorganizing the federal apprenticeship program, there is an urgent need for the states to independently reassess their apprenticeship activities. In the long run every state would be better off by investing considerably more funds in its high-skill training programs. This is being necessitated by the growing number of dislocated and displaced workers, by the changing technology in the work place, and by the need to spend tax dollars allocated for vocational education more efficiently.

Apprenticeship has proven to be a good investment of the taxpayer's money. States generally realize a two-fold increase in tax revenue as paid by the skilled craftsman for each dollar the state spends on promoting his or her apprenticeship.

Most states need to increase their appropriations for apprenticeship training by a factor of ten. Notably, many states provide at least one home demonstration agent for each county while apprenticeship programs are staffed with only a few individuals statewide.[14] Consideration should be given to staffing every industrial county with at least one apprenticeship representative.

It is also important to point out that apprenticeship is a training system that is not limited exclusively to either a union or non-union environment alone. It is clear that it works effectively in any setting where there is an apprenticeable occupation and where there is a serious intention on the part of a program sponsor to train aprentices. In North Carolina, for example, there are 34 programs of the about 1,350 programs that are currently registered that have any form of union involvement, which amounts to about two and one-half percent of the total number of programs. On the other hand about ninty-seven and one-half percent of North Carolina's registered apprenticeship programs have no union involvement.

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[14] North Carolina has 550 county agricultureal agents located in its 100 counties. Of these 185 are home demonstration agents. These employees are funded 23 percent by local county governments, 35 percent by the Federal Government, and 42 percent by the State government.

## NEW TEACHING TECHNOLOGY

Both the emergence of new science and technology with its accompanying new high-skill occupations and the development of new materials, machines, and processes relative to the older apprenticeable occupations necessitates the continuing development and refinement of the curricula used for training journeymen craftworkers.

Indeed, in an address before the North Carolina Job Training Coordinating Council October 18, 1983, at the Raleigh Hilton in Raleigh, North Carolina, Dr. Carl Dolce, Dean of the School of Education, North Carolina State University, University of North Carolina, pointed out that even " 'Basic Skills' include the development of attitudes, motivation, and discipline, as well as the ability to analyze, think critically, and comprehend."

Audio-visual technology and the arrival of multi-channel cable television open up new opportunities for the development and provision of more accessible, more efficient, more thorough, and less expensive quality training. Individualized instructional media such as programmed learning, educational television and the use of the home and business computer provides a whole new opportunity for arming our nation's work force with the skills that the workers need in order to enjoy employment and that the nation needs in order to be internationally competitive.

The provision of an entire library of audio-visual curriculum materials for all of the nation's apprenticeable occupations is estimated to cost between $1 and $5 billion dollars, depending upon who the contractors are and how well they are supervised. Some proprietory sponsors of apprenticeship have developed high quality full-curriculum materials at a cost of approximately $2,000,000 per curriuclum.

The International University Consortium for Telecommunications in Learning presents a model in liberal arts teaching technology for also establishing a similar consortium of business and government for telecommunications in the teaching of technology and skills.[15]

The corporate campus is a tremendously large and growing adult educational program. Corporate America is using teletraining, interactive video, programmed instruction, electronic libraries and corporate computers to train and educate its employees.

"At our bank, we have a fully staffed and equipped video production studio which produces 70 training videotapes a year, to go along with the heavy classroom training we do." [16]

The nation must also begin to take seriously the challenge of providing continuing education to adult students, who often may be displaced workers. We must begin to understand what we can about the adult learner. We need to find our what motivates the adult learner. We need to discover the educational media that appeals to the adult learner, especially those who have not been in a formal educational setting for many years. We also need to inaugurate a program capable of transcripting the adult learners' successful completion of certified courses.

We need to try to discover newer educational instruction media such as teleconferencing, interactive educational technology, and others that appeal to the adult learner. New instructional technology provides the United States a great opportunity to improve and expand educational opportunities in a quality manner.

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[15] The International University Consortium for Telecommunications in Learning (Inc.) is a national project supported in part by the Carnegie Corporation of New York. It's address is the Center of Adult Education, Adelphi Road and University Boulevard, College Park, Maryland 20742 and P.O. Box 430, Owings Mills, Maryland 21117. The telephone number of the College Park address is (301) 454-6627 and the telephone number of the Owings Mills address is (301) 356-5600. The International University Consortium for Telecommunications in Learning now has one major program. The Consortium is committed to providing members of this program with a Bachelor's degree curriculum for adults who cannot, or choose not to, enroll in courses on campus, full time. IUC courses are in three areas of study: Technology in Management, Behavorial and Social Sciences, and Humanities. The Consortium develops its own courses and adapts British Open University courses. IUC currently has access to 140 Open University courses developed by eminent scholars and broadcasting experts at a cost of roughly $700 million.

The British Open University was chartered in 1969; by 1980 it was enrolling 90,000 students a year and had 50,000 graduates. The first IUC students were enrolled in September 1980, in the seven institutions and affiliated broadcasting services selected to participate in the pilot year. IUC's course development processes, teaching method and many of its original materials were adapted from the highly acclaimed British Open University. In its second year, IUC operated in 11 states. In July, 1982, 17 institutions and 23 television stations and cable systems belonged to the Consortium.

[16] Cameron.

## COMPETENCY-BASED APPRENTICESHIP

Traditionally, formal apprenticeship has been organized on a time basis with an apprentice typically spending four or five years working with a journeyman craftworker while taking 144 hours of related instruction each year. Completion of the time resulted in the ending of the apprenticeship and certification by the employer that the trainee had become a journeyman craft-worker. While this time-based approach has not always been successful and has left many employers discontented with the end result, new teaching technologies have opened the way to the provision of competency-based or proficiency-based apprenticeship training.

Competency-based apprenticeship allows an apprentice to advance at whatever rate is comfortable for that trainee while assuring that "completion" signifies a mastery of both theory and proficiency associated with the craft.

Competency-based or proficiency-based apprenticeship requires standardized tests to determine each apprentice's mastery of a required minimum level of proficiency necessary for becoming a journeyman. There is little justification for each state to design, produce, and validate these tests separately. Not only would the costs be prohibitive, but the validation part of the process requires larger numbers of tested apprentices than most states have for a given trade. In addition, there is a need for recognition and registration of qualified journeymen on a national basis. Indeed, one of the services that a national apprenticeship program should provide is a nationwide registration system for journeymen craftsmen. With today's computer technology, such a system could be easily developed.

National curriculum committees need to be established for each recognized craft. These committees should be charged with reviewing and recommending standards as well as for developing minimum curricula for each apprenticeship program. The establishment of a national institute for high-skill training would be invaluable for overseeing the design, development, and manufacture of quality related-training and testing materials. A proposal for such an institute to be established at the state level by North Carolina is attached as appendix E.

Such an institute could monitor new developments that impact upon high-skill crafts and it could accelerate the adoption of these developments into the craft training materials. The institute could also fill several important voids in this country's vocational education apparatus by (1) being a training center to train and upgrade the teachers who are needed for local-based vocational education; (2) assisting in the design of curricula and tests; (3) providing training in crafts where the scarcity of journeymen prohibits local training, and (4) initiating training and complementing curricula for newly identified crafts.

## APPRENTICESHIP FINANCING

It is again important to note that the nation's apprenticeship program is an employer financed training system. While there is no proposal that this be significantly changed, it is suggested that government incentives be inaugurated that will encourage a much greater use of employers resources in behalf of formal apprenticeship training.

The role of governments in the apprenticeship program is circumscribed. The government's role is that of a catalyst/facilitator, promoter/organizer, minimum standards determinator/program certifier, and guarantor of availability and accessibility. The role of governments is not conceived to be that of a deliverer of training as program sponsors.

The appropriate role of governments, nevertheless, requires an adequate level of funding that has not been experienced in past years.

Financial resources are critical to the success of the apprenticeship system in the United States. For example, the states, such as Nortth Carolina, that operate a state apprenticeship council are on their own, financially. There is no subsidy from the federal government for the states acting to carry out the business of the federal government in apprenticeship. Moreover, even the most well-financed states suffer a significant underfinancing of their apprenticeship system. As a further example, it has been recommended that there be an increase in the size of the apprenticeship field staff in North Carolina by approximately 50 workers [17] in order to market and service apprenticeship at an appropriate level. The North Carolina General Assembly has been unable to find its way clear to give the financial support required for such a significant initiative. It is obvious that the federal government has the resources to fund the states to this level of staffing and could financially justify it on the basis of the present tax income generated by apprentices that are presently registered, with any additional apprentice-generated tax income being, essentially, a financial boon to the government.

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[17] North Carolina currently has a state-employed apprenticeship staff consisting of a director, an assistant director, six clerical, and 16 field representatives.

There is little doubt that training and remediation activities for persons of limited employability are profitable. According to the best available evidence, short-duration local classroom training raises earnings by a tenth in the year after termination, while training on-the-job yields increments almost twice as large. Comprehensive residential training for the most disadvantaged youths pays off in earnings gains of a tenth as well as large reductions in crime and dependency. Moreover, the impacts of local classroom and residential training pays off more than proportionately. Every dollar spent on residential training yields at least $1.45 in social benefits, according to conservative estimates of the current values of benefits and costs and after accounting for alternative real returns on the same resources. Local classroom training returns an estimated $1.38 for each dollar invested, while the payoff of on-the-job training is substantially greater. The investment in remediation and training is, thus, at least as profitable as the investment in higher education, and it is profitable despite labor market conditions which currently militate against training and despite correctable shortcomings in programs and policies.[18]

Equally important is the fact that apprenticeship training is a good business deal for government. According to a recent document prepared by the acting administrator of the United States Department of Labor (USDL) Bureau of Apprenticeship and Training, state and local government receives about $17.000 in taxes paid by apprentices for every dollar it spends in administering the apprenticeship system, while the apprentices are in training, not years later. From the standpoint of simple enlightened self interest, it is incredible that the United States has not made apprenticeship its number one priority for worker training. It is obviously the only recognized training system that is more than totally self-supporting while the training is taking place. It should also be pointed out that the acting administrator of the USDL Bureau of Apprenticeship and Training used an average apprenticeship wage of about $4.00 per hour in making his calculations, while in "poorly paid" North Carolina the average hourly wage of apprentices exceeds $6.000 per hour; thus, the return to government shown in the referenced administrator's report may be considered substantially understated on a national basis.

Oftentimes those formulating new legislation desinged to promote and support a new or expanded endeavor (such as increasing the supply of military hardware) realize that the supply of craftsmen in the American workforce required to achieve the desired goal is inadequate. Typically they propose some measure to promote high-skill training in the occupations necessary for the fulfillment of the stated objectives. The objectives, however, are seldom achieved because the drafters of the legislation overlook the fact that it is the state and territorial governments and not the federal Government that have the principal responsibility for promoting and registering apprenticeship programs. Legislators seldom allocate resources to state agencies to enable the agencies to expand their efforts to promote and register desired apprenticeship programs. Because state agencies are servicing all the recognized apprenticeship programs that their current resources will permit, efforts to expand the training of high-skill craftsmen will be futile unless additional resources are provided to the agencies. It should also be pointed out that most state governments are experiencing economic hard times because of the current recession. As a result, they are decreasing or, at best, leaving unaltered their appropriations to apprenticeship promotional, approval, and accrediting agencies. Even where appropriations are not cut, inflation continues to erode these agencies' rates of productivity in generating journeyman-level craftsmen.

It is often the practice of Congress, when drafting new legislation, to provide "set-aside" funds from those monies appropriated for the purpose of carrying out the provisions of an act in order to assure the proper funding of special emphases of a particular program. CETA and JTPA, for instance, provide for "set-asides" for the funding of the "Job Corps," but do not provide for any "set-asides" in behalf of apprenticeship. These acts, as well as Section 2306 of the Vocational Education Act and future legislation in support of maintaining a viable military industrial manufacturing capacity, should all provide for "set-asides" in behalf of formal apprenticeship.

Despite inadequate government promotion, apprenticeship training continues to be a viable process for producing journeyman-level craftsmen. The public, the employer, and the employee all benefit from apprenticeship. Such training is an economical approach to producing craftsmen because (1) private employers, using private machinery and resources, pay for the training and (2) the training process takes advantage of the proven ability of a recognized journeyman-level craftsman while simultaneously producing a marketable product. The sale of the end product usually offsets a large part of the training costs. Public educational institutions could not begin to duplicate most industry-run apprenticeship programs because of the prohibitive cost of materials and machinery.

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[18] Taggart, p. vii.

Whenever the United States takes manpower development seriously, the future of the Nation's economy will brighten and the Nation will be enabled to deliver on its promise to her people of providing "life, liberty, and the pursuit of happiness".

## APPENDIX A

### THE FITZGERALD ACT, H.R. 7274

AN ACT to enable the Department of Labor to formulate and promote the furtherance of labor standards necessary to safeguard the welfare of apprentices and to cooperate with the States in the promotion of such standards

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Labor is hereby authorized and directed to formulate and promote the furtherance of labor standards necessary to safeguard the welfare of apprentices, to extend the application of such standards by encouraging the inclusion thereof in contracts of apprenticeship, to bring together employers and labor for the formulation of programs of apprenticeship, to cooperate with State agencies engaged in the formulation and promotion of standards of apprenticeship, and to cooperate with the National Youth Administration and with the Office of Education of the Department of the Interior in accordance with section 6 of the Act of February 23, 1917 (39 Stat. 932), as amended by Executive Order Numbered 6166, June 10, 1933, issued pursuant to an Act of June 30, 1932 (47 Stat. 414), as amended.

SEC. 2. The Secretary of Labor may publish information relating to existing and proposed labor standards of apprenticeship, and may appoint national advisory committees to serve without compensation. Such committees shall include representatives of employers, representatives of labor, educators, and officers of other executive departments, with the consent of the head of any such department.

SEC. 3. On and after the effective date of this Act the National Youth Administration shall be relieved of direct responsibility for the promotion of labor standards of apprenticeship as heretofore conducted through the division of apprentice training and shall transfer all records and papers relating to such activities to the custody of the Department of Labor. The Secretary of Labor is authorized to appoint such employees as he may from time to time find necessary for the administration of this Act, with regard to existing laws applicable to the appointment and compensation of employees of the United States: Provided, however, That he may appoint persons now employed in division of apprentice training of the National Youth Administration upon certification by the Civil Service Commission of their qualifications after nonassembled examinations.

SEC. 4. This Act shall take effect on July 1, 1937, or as soon thereafter as it shall be approved.

Passed the House of Representatives June 30, 1937.

## APPENDIX B

### JOINT MEMORANDUM TO THE CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE ON APPROPRIATIONS FOR THE DEPARTMENT OF LABOR, HOUSE OF REPRESENTATIVES

From: The Department of Labor and the Office of Education.

In re apprenticeship.

There seems to be some question in the minds of the committee members as to which phases of apprentice training relate to labor standards and which relate to education. It is clearly and officially recognized by the President, the United States Office of Education, the United States Department of Labor, the National Youth Administration, the American Federation of Labor, various national associations of employers, and State governments that there are two distinct groups of responsibilities and functions in the promotion and subsequent operation of plans for apprentice training. One group deals with the apprentice as an employed worker—the conditions under which he works, his hours of work, his rates of pay, the length of his learning period, and the ratio of apprentices to journeymen so that overcrowding or shortages of skilled workers in the trades may be avoided in large part. The second group of responsibilities deals with the apprentice as a student—the related technical and supplemental instruction needed to make him a proficient worker and the supervision and coordination of this instruction with his job experience.

The United States Office of Education and educators generally have not conceived it to be a part of their function in providing educational training for apprentices to give consideration to problems which relate to labor standards. Mr. Frank Cushman, Chief of the Trade and Industrial Education Service of the United States Office of Education, has stated, "We think there are two groups of responsibilities (in apprenticeship). One group has to do with labor standards, wages, hours, quotas, length of apprenticeship period, etc. The other group has to do with education and training of apprentices." Mr. Thomas Quigley, professor of industrial education at the Georgia School of Technology, and vice president of the American Vocational Association, said recently, "Certainly the vocational schools and their staffs do not wish to entangle themselves in the wages, working hours, and labor disputes involved in apprenticeship agreements any more than they do in other issues extraneous to the schools' one great job of training and coordinating such training."

There also seems to be a question in the minds of the committee members as to whether the two distinct phases of apprenticeship can be most effectively furthered nationally by a single administrative agency or by the two Government agencies which have jurisdiction, experience, and facilities in the respective fields. It has been amply demonstrated that the responsibilities in connection with the apprentice as an employed worker can best be carried on by the State labor department which is charged with the general responsibility of improving working conditions and fostering the well-being of the workers, and that the responsibilities in connection with the apprentice as a student can best be performed by the State board for vocational education. These State agencies in turn look to the United States Department of Labor and to the United States Office of Education for leadership and research and for the determination of national standards in their respective fields.

Except in a few States there has been no adequate machinery developed to promote uniformity and give adequate protection to employment standards of apprenticeship. Partly because of lack of interest in apprenticeship on the part of employers and partly because of this lack of machinery, this vital system of training for the highly skilled trades has not kept pace either with the needs of industry or with the opportunities for employment in the skilled trades. The United States Employment Service, as a consequence, warns that unless apprentices are put on now, within a very short period of time there will be a real shortage of skilled workers in many of our most important industries. Labor has repeatedly expressed itself in opposition to any apprenticeship program that does not provide proper safeguards for labor standards. If young workers are to be apprenticed to prevent this impending shortage, the trade-unions must be assured that the boys' interests will be safeguarded, that labor standards will be upheld, and that the apprentice will not be put on at the expense of the older worker. The agencies that can gain the cooperation of the trade-union movement with employers in the development of the labor standard phases of apprenticeship are the labor departments—Federal and State.

With funds for apprenticeship promotion on a national basis, the Department of Labor will be carrying out the purpose for which it was created, "to foster, promote, and develop the welfare of the wage earners of the United States, to improve their working conditions, and to advance their opportunities for profitable employment." It will in no way encroach upon the work now being done by the United States Office of Education, but, on the contrary, as evidenced by the activities of the Federal Committee on Apprentice Training during the past 2 years, will vitalize and greatly increase the demands upon the school authorities for preapprentice training, related instruction for apprentices, coordination of this instruction, with job experience, the preparation of trade analyses and outlines of instruction and for specially trained teachers to carry on these functions.

## APPENDIX C

The North Carolina Department of Labor has assembled the following information in response to inquiries about occupations in which many of the new jobs will occur in North Carolina.

## ANTICIPATED ANNUAL AVERAGE JOB OPENINGS FOR PRIORITY OCCUPATIONS RANKED BY HIGHEST ANNUAL AVERAGE JOB NEEDS 1983–90, NORTH CAROLINA STATEWIDE TOTALS

[Those occupations that are apprenticeable are indicated with the number of years of training generally required]

| Occupational description | Apprenticeable | | Annual job openings | | |
|---|---|---|---|---|---|
| | Yes/No | Years training | Growth | Replacement | Total |
| Stenographers | No | | 7,063 | 3,920 | 10,983 |
| Clerks, general office | No | | 4,445 | 2,910 | 7,355 |
| Clerks, sales | No | | 1,766 | 3,081 | 4,847 |
| Nurses aides, orderlies | Yes | 1 | 2,271 | 1,334 | 3,605 |
| Truck drivers | Yes | 1 | 2,268 | 1,234 | 3,502 |
| Cashiers | No | | 1,368 | 1,629 | 2,997 |
| Assemblers | No | | 2,152 | 569 | 2,721 |
| Waiters and waitresses | No | | 1,695 | 845 | 2,540 |
| Nurses, licensed practical | Yes | 1–2 | 1,369 | 1,006 | 2,375 |
| Nurses, registered | No | | 1,376 | 897 | 2,273 |
| Sewing machine operators | No | | 662 | 1,513 | 2,175 |
| Food preparation and service workers, fast food restaurants | No | | 1,246 | 746 | 1,992 |
| Maintenance repairers, general utility | Yes | 2–4 | 1,354 | 550 | 1,904 |
| Sales managers, retail trade and store | No | | 713 | 1,099 | 1,812 |
| Mechanics, automotive | Yes | 3–4 | 951 | 569 | 1,520 |
| Stock clerks | No | | 879 | 640 | 1,519 |
| Heavy equipment operators | Yes | 2–4 | 839 | 661 | 1,500 |
| Carpenters | Yes | 4 | 607 | 845 | 1,452 |
| Mechanics, heavy equipment | Yes | 3–4 | 816 | 411 | 1,227 |
| Police and detectives | Yes | 1–3 | 920 | 233 | 1,153 |
| Drafters | Yes | 2 | 955 | 187 | 1,142 |
| Keypunch (data entry) operators | No | | 608 | 318 | 926 |
| Electrical, electronic technicians | Yes | 2–4 | 722 | 166 | 888 |
| Plumbers and/or pipefitters | Yes | 4 | 439 | 397 | 836 |
| Electricians | Yes | 4 | 490 | 315 | 805 |
| Welders and flamecutters | Yes | 1–2 | 505 | 182 | 687 |
| Machinists | Yes | 4 | 459 | 185 | 644 |
| Computer systems analysts | No | | 503 | 77 | 580 |
| Computer programers | Yes | 2 | 467 | 72 | 539 |
| Painters, construction and/or maintenance | Yes | 3 | 236 | 289 | 525 |
| Precision machine operatives | Yes | 1–4 | 373 | 125 | 498 |
| Computer operators | Yes | 1 | 418 | 73 | 491 |
| Clinical lab technologist, technicians | Yes | 1–3 | 320 | 135 | 455 |
| Diesel mechanics | Yes | 3–4 | 288 | 156 | 444 |
| Cement masons | Yes | 2–3 | 191 | 129 | 320 |
| Designers | Yes | 1–2 | 177 | 119 | 296 |
| Mechanics, heating, air-conditioning, and refrigeration | Yes | 2–4 | 166 | 91 | 257 |
| Structural steel workers | Yes | 3 | 138 | 63 | 201 |
| Health record technologist, technicians | No | | 66 | 39 | 105 |
| Totals | | | 42,281 | 27,810 | 70,091 |

The above composite information has been assembled by the North Carolina Department of Labor from the best estimates provided by many sources and is not the product of a single survey or study.

## APPENDIX D

### PROPOSAL FOR A FEDERAL PROGRAM TO ESTABLISH AND MAINTAIN ECONOMIC, CONSTRUCTION, AND LABOR STABILITY IN THE HOUSING INDUSTRY

(By John C. Brooks Commissioner of Labor, State of North Carolina; and Vice President, National Apprenticeship Program, Inc.)

The backlog in needed construction of housing for Americans has reached an alarming level. Even though the housing industry is now operating at only 43 percent of capacity, the point of inelasticity in production can be reached within six months time and looms as precursor of critical economic conditions for the nation in the near future. On this Labor Day one can not help but observe the disastrously high level of unemployment and note particularly the irony of unemployed hom-builders in the face of a national crisis with regard the need for significantly more housing for Americans.

The following proposal is made made mindful of the Nation's commitment to the free enterprise system and the integral part that free enterprise plays in our housing industry and market and the integral part, in turn, which the housing industry plays in our free enterprise system, as well as the part that government already plays in the housing industry and market. It is today recommended that the United States Government embark upon a federal housing program which has as its principal objectives the establishment and maintenance of stability in the housing industry. The purposes of pursuing such objectives are to assure the availability of housing to meet the nation's needs at affordable prices reflecting "protected" values, to aid the reestablishment of economic stability generally, and to train a labor force capable of and employed continuously building a minimum of 2,000,000 units of housing for Americans annually, without in any way impairing our free enterprise system.

The United States has a history of establishing and supporting commodity stabilization programs. This is a proper role of government. This proposal does not suggest that government take over the responsiblity for providing Americans the housing that they need. It does advocate, however, that the government foster economic stability, foster stability in the labor market, and assure the ability of the nation to provide a minimum number of additional housing units each year.

The United States is generating a need for additional housing units at an annual rate of 2,300,000 or more. As recently as four years ago the journeymen-level craftsmen in the eighteen building trades and their helpers had the capacity to construct 2,300,000 untis of housing each year. Beyond that number the housing industry is currently inelastic. Today the housing industry is producing at the rate of approximately 1,000,000 units annually. There are many craftsmen and helpers unemployed. Many of these former employees have left the industry. Many will never make themselves available to this industry again because of their frustration with the cyclical, and seasonal employment/unemployment which it has provided them. How many of these craftsmen will be unavailable in the future remains to be determined.

It takes four or five years to train journeymen electicians, plumbers, carpenters, sheet metal workers, etc. Relatively few are in training today. A critical shortage of these craftsmen is imminent.

As interest rates recede, many of the 7,500,000 family units who desire housing, but who have restrained their demand for housing during the past decade because they felt that they could not afford it in the current financial market place, will conclude that the time has arrived to seek their long-desired units of housing. This may result even though a fall in interest rates is not commensurately reflected in a fall in the costs of home mortgages just out of the realization by millions of would-be home buyers that the availability of more desirable and acceptable home mortgages is not in the offing. As these home buyers enter the housing market, demand will rise from the current level of 1,000,000 units per year. Demand can and will rise to the level of 2,300,000 units annually in a short span of time—possibly within six months as compared to the four years required to train journeymen-level builders. Demand, because of the pent-up backlog, will significantly exceed 2,300,000 units annually.

When this happens, those unemployed building craftworkers and their helpers who are willing to, will rejoin the home construction industry. Nevertheless, demand potentially will exceed supply within a year's time. (The total unmet demand for 1983 will approximate 9,800,000 units of housing.) The result will be significant increases in the costs, and value, of housing.

This means that conditions in the housing industry and the housing market will most likely lead the next, and successive rounds of inflation. As inflation ballons to tweny and twenty-five percent annual levels, the federal government most likely will again take the steps to deflate the economy, leading to successive periods of recession. Interest rates will most assuredly zoom back up. And much-needed housing will become even more out-of-reach for the average American family.

The answer? A significant part of the answer must be the expansion of the housing industry to enable it to meet demand as that demand shoots by the industry's current maximum level of ability to supply 2,300,000 units, or less, of housing annually. Such an expansion requires the training of craftsmen who are not now in training.

How does a society get people interested in learning a trade and committed to pursuing the required four-year curriculum when half of the relevant industry is closed down? This is clearly a dilemma and national challenge which the housing industry can not meet by itself either today, or at any time in the near future.

This is where the people of America join in through their corporate representation in the United States Government. The nation should establish a federal housing program designed to contract with private builders for the construction of such number of housing units annually which represents the difference between the number of housing units that private enterprise is constructing on its own initiative and 2,000,000 units. Observing that the median price of a house in America in 1981 was $72,400.00, the government should probably contract to have built townhouse and condominium-type housing with a retail value of approximately $50,000–$60,000, although the kind of housing might reasonably vary in different locales. Reflecting national policy objectives to foster land conservation, minimize fuel consumption, and promote urban revitalization, these housing units should probably be near-downtown, multi-family developments.

This housing should not be placed on the market for sale at this point, but should be rented or leased. Whenever the private housing market exceeds 2,000,000 units annually, the United States Government should discontinue its construction program and proceed to place such number of housing units on the market for sale as represents the publicly declared excess of demand for housing over 2,000,000 units annually. The number of federally-owned housing units offered for sale should be increased in accordance with a schedule reflecting total demand in excess of 2,000,000 units annually until they have either been exhausted or the number of housing units being built by the private sector on its own initiative again drops below 2,000,000 units annually.

This sell-off program, perhaps needless to say, will not augment the supply of housing when demand exceeds the level of 2,000,000 units annually since it can not be counted twice depending upon whether it is rental or for-sale property, but the sell-off program would be a feature designed to reduce the government's investment in housing at such time as that purpose could best be pursued without impacting in an undesirable way upon the construction of housing units by private builders on their own initiative. Moreover, the sell-off program would be an added feature designed to reduce the inflationary impact resulting from housing demand significantly exceeding supply on future occasions. In other words, the governmentally-initiated built housing might be rented at a loss, while this loss might be recovered when units are later sold at market prices reflecting inflated value due to scarcity.

An accomplishment of this program would be that it would protect jobs for the highly skilled artisans who are already in the building trades, and whose skills are needed both to construct the housing that Americans need and to train the highly skilled building craftsmen for tomorrow. Most of the journeymen in the building trades are the product of on-the-job training formal apprenticeship programs. These training programs must continue in recessionary periods as well as periods of prosperity if the nation is ever to be prepared for prosperity, but currently they are not keeping pace.

A feature of this federal housing program should be the establishment of a required formal apprenticeship training program inclusive of all construction projects that are a part of the program. This would provide a source of journeymen to the private sector in periods when the economy is recovering and expanding.

Even now it is likely that the implementation of this proposed federal housing program would be too late to forestall the next cycle of inflation caused by the conditions that have been described above; however, implementation in the near future would hopefully and reasonably impact favorably upon the next cycle and help to forestall successive cycles thereafter.

## APPENDIX E

### MEMORANDUM

To: Members of the North Carolina Board of Science and Technology.
From: John C. Brooks.
Date: November 4, 1983.
Re establishment of Center for Applied Technology and Skills.

The draft of the proposed final report of the Governor's Task Force on Science and Technology addresses recommendations to the State's needs for technical training and employee retraining to each of Chapters II, III, and IV. These recommendations, while helpful, do not actually cover adequately the needs which are sought to be addressed. In keeping with the theme of the report, "New Challenges for a New Era: Progress Through Innovation, Education and Research in North Carolina," I should like to convey a recommendation for the Board's consideration for inclusion in its final report which might pull together helpfully these recommendations on technical training and retraining into a more comprehensive proposal with a more specific focus.

There are some 24,000 occupations which are defined by the U.S. Department of Labor and which are pursued in our society. Of these, 800 are considered to be high-skill, non-professional. These are the skills whose masters are termed "journeymen." The predominant current existing educational mechanism in North Carolina for training persons in these 800 crafts is through formal apprenticeship training provided by private employers through on-the-job training. Most of the training provided through this mechanism is neither duplicated nor complemented through any institutional curricula or related training. The training for most of these crafts is now of four to five years duration.

When one reviews the spectrum of educational institutions provided by the State of North Carolina, one finds a gap in the educational structure with regard to the existence of any instituion which is charged with generating and offering curricula in these particular skills.

The two-year community college system predominantly offers liberal arts curricula with a few high-skill related courses which are in themselves insufficient to train journeymen-level craftpersons. These institutions have neither the faculty, laboratory facilities, nor libraries adequate to train journeymen-level craftpeople. The provision of an adequate faculty would require faculty salaries from 50 to 100 percent higher than the maximum currently authorized within the community college system. This is partly due to the fact that journeymen-level craftpeople in North Carolina are currently averaging approximately $27,000 annual income and are nationally averaging almost $37,000 annual income in the private sector. The provision of adequate libraries and laboratories for hands-on training would require the expenditure of significantly more monies by the State and local governments than any current appropriations which are being contemplated would conceivably supply.

The university system generally picks up technical curricula in the professional occupations; however, the system does provide some curricula offerings which would complement needed curricula in some of the apprenticable occupations. The apprenticeable occupations are characterized by both a high level of understanding of theory and mathematics, and the development of proficiency in manual manipulation. A list of these apprenticeable occupations is attached in an appendix.

Set forth below is a proposal for the establishment of a Center for Applied Technology and Skills in Raleigh, North Carolina.

### LOCATION OF FACILITY

It has been determined that the State no longer needs as many centralized psychiatric hospitals as it now has. As a result of this determination, there is under way a project to phase out Dorothea Dix Hospital as such a facility. It is herewith proposed that the Dorothea Dix campus, with its two thousand acres and dormitory space, be converted into a residential Center for Applied Technology and Skills. The conversion of the physical facilities into a Center for Applied Technology and Skills could be achieved within a short period of time, would save the State millions of dollars in capital expenditures for such a facility, and would be a very practical conversion of the existing facilities. The proximity of this institution to North Carolina State University would highly facilitate attracting competent faculty members, permit the avoidance of duplication of basic educational courses which such a center would otherwise require, and provide access to a major library which would reduce some of the needs of duplication which the establishment of a comprehensive research library for the new center otherwise would require.

### MEETING THE NEED FOR QUALITY FACULTY

The kind of Center for Applied Technology and Skills which is needed in North Carolina requires a highly skilled faculty capable of conducting research, designing curricula, developing and validating tests; and capable of teaching graduate students. To have an effective institution requires a "critical mass" of competent faculty members. It is not enough, even if it were possible, to have a single competent faculty person at a random community college who might undertake to design curricula and tests and conduct research in a given apprenticeable occupation. Over and beyond the problem of an inadequate faculty salary schedule to attract such a person, such a faculty member would not normally be attracted by the professional status and professional support system furnished under such conditions. The establishment of a Center for Applied Technology and Skills would offer faculty members the required professional status and support system needed to attract the quality of faculty members such an institution would need to have to be successful.

The faculty salary schedule established for this kind of facility could take into consideration both the added responsibilities and higher mission of the facility and thus accommodate the need to have competitive salaries sufficient to attract the needed faculty. This would mean that the faculty salary schedule would be considerably higher than that which is presently available to the community college system.

An additional mission of this facility would be to train the faculty which our community college system is in need of to accommodate the provision of as much of the curricula for teaching applied technology and skills as might be usefully and appropriately distributed to and implanted in the various institutions within the community college system. Such a facility or institution might also design and administer a certification system for such teachers.

### MEETING THE NEED FOR CURRICULA

There is currently no institution in North Carolina where curricula for courses in applied technologies and skills are developed and updated. To begin with, there is not currently a faculty in place in North Carolina capable of designing the curricula which is needed in these areas. The level of expertise and ability which this requirement demands will have to be assembled if the job is to be done. One of the benefits of establishing a Center for applied Technology and Skills is the assemblage of a faculty capable of developing the curricula which are needed in North Carolina for training persons with the marketable skills demanded in the work place. The curricula which are designed at this center may be disbursed for use in the high schools for use at the junior and senior levels, in the community colleges, and in public and private institutions of higher education; as well as at the center itself.

### MEETING THE NEED FOR WELL-EQUIPPED LABORATORIES

The four to five years of training which is normally required to produce journeymen-level craftworkers necessitates the students developing manual proficiency through hands-on experience with the tools and resources of their trade. This requirement can be met in one of two ways on a practical basis: (1) through the utilization of the equipment and resources of private industries in the normal production of the products of business, and (2) through the provision of facsimile facilities in laboratories of an educational institution. While the first alternative is most economical and in many instances will be the only practical approach due to the exorbitant expense of the type of equipment and resources required to develop manual proficiency, the provision of laboratory facsimile training facilities will be desirable in many situations to accommodate large numbers of students, to facilitate research, and to provide training opportunities where a complete training facility is not available in a single business in North Carolina. The kinds of laboratories that the teaching of applied technology and skills required are very, very expensive to establish. It can cost in thousands to millions of dollars to equip a single laboratory for the teaching of a single craft. It is not reasonable to contemplate that the community college system of North Carolina will have the resources from either the State or local sources sufficient to equip adequate laboratories for the teaching of very many high technology and skill curricula. Currently, the community college system of 58 institutions has only a handful of schools which offer well-equipped laboratory facilities for the teaching of more than four crafts.

While the State as a whole may need 50–100 high-skill craftpersons a year trained in a given craft, the need, when distributed throughout the State, often does not justify the establishment of a well-equipped laboratory at a single existing community college. The assemblage of a sufficient number of students to make the offering of a curriculum and the provision of a well-equipped laboratory efficient and economical suggests that in many instances a residential institution is necessary in order that the students wishing to pursue the training can assemble in a central location where a well-equipped laboratory can be provided.

### MEETING THE NEED FOR TEST DEVELOPMENT AND VALIDATION

The teaching of applied technologies and skills requires the ability to certify the students' achievements and proficiencies upon completion of individual modules of training. There is currently unavailable adequate tests for determining this certification. One of the roles of this particular center would be the development of tests and their validation.

### MEETING THE NEEDS OF STUDENTS

In many instances this Center for Applied Technology and Skills would offer curricula which is otherwise unavailable in North Carolina. An example of such a curriculum would be one to train elevator mechanics.

In cases where a curriculum has been implanted into the community college system, students pursuing the third and fourth year level of the program could transfer to the center where the advance levels of training are available and where a faculty is assembled capable of teaching these levels of the curriculum. A faculty capable of teaching these advanced levels of such curricula can not be found in the community college system today.

This center would also be a facility for training new faculty members both for the center and other institutions which might teach components of the curricula which the center generates. It also would have the capability of guiding the work of graduate students in vocational education.

### MEETING THE NEEDS OF THE EXISTING WORK FORCE

Many of the persons who are in need of training opportunities in North Carolina are already members of the work force and are already employed. One of the functions of the center, and a very important one, would be the designing of training programs which can be implanted in existing businesses for the utilization of workers who are on the job. These programs would permit workers to retrain for the new technologies which are introduced in the industries in which they are already working.

### MEETING THE NEED FOR RELATED-INSTRUCTION MATERIAL

While there is some high quality related-instruction material already in existence for some of the 800 high-skill occupations, most of this material has been produced by proprietary interests which either restrict access to the use of the material or sell its usage per student at an unreasonably high price. There needs to be at least one facility in North Carolina with the audio-visual production capacity to produce related-instruction materials which can be packaged and distributed to the high schools and community colleges for use in the classroom as well as for use in learning labs wherever they may exist. This function of a center of this kind could be the one which has the greatest impact upon opening opportunities for training in many occupations to women, blacks, and others to whom opportunity is now denied. The equipping of an adequate production center for related-instruction materials would require both expensive equipment and high-priced editors and production personnel that can only be efficiently located in a single facility in the State of North Carolina. Adequate related-instruction materials are generally unavailable in North Carolina today. The lack of a capacity for production of this kind of material is impeding the provision of more curricula in the apprenticeable occupations today.

### MEETING THE NEED FOR RESEARCH

There is a tremendous need not only in North Carolina, but in all of America, for the conduct of significant research in the teaching of vocational education. The conduct of creditable research requires a good faculty, well-equipped laboratories, a good library, grants, and a supply of research fellows. The conduct of research is not one of the contemplated activities of the community college system. Research with regard to the teaching of applied technologies and skills in apprenticeable occupations is not currently being conducted to any significant degree in the University of North Carolina. The kind of center that is contemplated in this proposal would support the conduct of significant research in these areas of vocational education. A faculty of substance could be assembled that is of sufficient size to support the worthwhile activities of research fellows who might be attracted to this facility.

### MEETING THE NEED FOR LIBRARY SUPPORT

A specialized library of materials is necessary if the kind of curricula development and research set forth above is to be conducted in the State of North Carolina. There is currently no assemblage of materials anywhere in North Carolina adequate for this need. In fact, there are few library assemblages of materials of this kind anywhere in America today. The best library of this kind of material of which I'm aware is a 60,000-volume collection at Ohio State University. While that particular collection is available for use at the location in which it is situated, it is not a lending library. The second best library of this kind of material may be at the University of Texas.

No one institution within the community college system nor the central community college administrative offices themselves have adequate resources, or are likely ever to have adequate resources, with which to assemble a library sufficient to support curricula development and research in the apprenticeable occupations. If the State is serious about providing training opportunities in these crafts, a library will have to be assembled to accommodate this need.

### MEETING THE NEED FOR PUBLICATIONS

A professional cadre of teachers and training directors in North Carolina's high schools, colleges, community colleges, and private industry in the fields represented by the apprenticeable occupations needs the support and information which can be provided through publications and journals addressing their particular fields and interests. Such publications and opportunities for publication do not currently exist in North Carolina. Those persons in these areas of vocational education are without the supply of information and support which is needed to keep them abreast of new developments and which are needed to develop a high level of professional competence in these fields. It would be practical to establish a location for the generation of such a publication or journal at the proposed Center for Applied Technology and Skills.

### MEETING THE NEED FOR GRANT DEVELOPMENT

There are many opportunities for the development of grant proposals for submission to federal government agencies and private industry which would inure to the benefit of research and development of curricula, curricula materials, and the establishment of demonstration projects in promotion of furthering the provision of quality training opportunities in the apprenticeable occupations. Most of these opportunities for the submission of grant proposals are not pursued in North Carolina because there is no one with the time and resources to write the grant proposals and to pursue the procedures required for obtaining and administering such grants. Millions of dollars in grants could successfully be procured for furthering the work contemplated for the proposed center were a staff assembled with the skills needed for this activity. Given the assignment and resources to pursue grants, the public would be amazed at the amount of funds that could be generated through this activity. A case in point is the recent offering of grants to the states in the Appalachian Region by the Appalachian Regional Commission for innovative programs in the provision of skill-training in the Appalachian Region.

### MEETING THE NEED FOR ESTABLISHING EMPLOYMENT POLICY PLANNING

While an effort is currently underway through a labor market information task force to develop a mechanism for the State of North Carolina state government to begin to collect and forecast labor market information, as a member of the task force, I can report that it is unlikely that any significant inroads will be made upon collecting an adequate amount of labor market information sufficient to be the basis for any useful forecasting activity in the near future. Ultimately, the development of labor market information and forecasting on a useful basis toward the end of developing an employment policy and planning the effective use of the State's resources for training North Carolina's work force in needed occupations will have to evolve upon an assemblage of persons who are not currently on the State's payroll. This function may very well be one that can more logically be performed by the assemblage of persons contemplated through the establishment of the proposed Center for Applied Technology and Skills. This function would complement the research which this kind of center would be conducting anyway.

### MEETING THE NEED FOR A BROKERAGE AGENCY

There is a role that needs to be played by some institution in the State of North Carolina that is not currently being played by anyone. This role is a combination of being a catalyst and a broker in working out cooperative arrangements between government, public and private educational institutions, and private businesses in the provision of vocational education training opportunities. The administrative office of the community college system does not and cannot effectively play this role because of its jurisdictional limitations. Vocational training curricula need to be designed which are then implanted, in some instances in high schools, in some instances in community colleges, in some instances in private colleges, in some instances in branches of the University, and in many instances in individual businesses. Additional complementing components or modules of a given curriculum which interface with those which are implanted in these situations need then to be provided in other institutions. The distribution of these programs in geographical areas of the State is yet another dimension of the brokerage activity which should reflect the determinations of labor market forecasting and student/employee training needs and requirements. There needs to be a central facility with the ability to comprehend the entire provision of occupational education opportunity in the State of North Carolina. The proposed Center for Applied Technology and Skills could accommodate this need.

## CONCLUSION

The establishment of the proposed Center for Applied Technology and Skills would assemble the resources necessary for effectively and efficiently providing the much needed services in support of the provision of adequate vocational education in North Carolina. The establishment of this center would fill a very significant void in the educational structure of the State. This center would have the resources and the "critical mass" necessary to be successful. This center would not be in competition with the current community college structure of this State, but would complete this existing system in very important needed ways and would, in fact, strengthen our community college system significantly.

Enclosure.

**DEPARTMENT OF LABOR**

**Office of the Secretary**

**29 CFR Part 29**

## Labor Standards for the Registration of Apprenticeship Programs; List of Occupations Meeting the Criteria for Apprenticeability

**AGENCY:** Department of Labor.

**ACTION:** Notice of Proposed Rulemaking.

**SUMMARY:** Title 29, CFR, § 29.4 (Criteria for Apprenticeable Occupations) sets forth the characteristics that denote an apprenticeable occupation. The Bureau of Apprenticeship and Training (BAT) has reviewed all occupations now considered apprenticeable by BAT or by one or more of the State and territorial apprenticeship agencies using the characteristics set forth in § 29.4. Appendix A is an initial listing of those occupations that appear to possess all of the required characteristics. Additional occupations now approved by BAT and/or one or more state or territorial apprenticeship agencies remain under review and will be published by list at a later date.

**DATES:** Comments must be received on or before May 12, 1980.

**ADDRESSES:** Send comments, communications, and inquiries to Paul H. Vandiver, Director, Office of National Industry Promotion, Employment and Training Administration, U.S. Department of Labor, Bureau of Apprenticeship and Training, Washington, D.C. 20213. Comments shall be in writing and submitted in duplicate.

**FOR FURTHER INFORMATION CONTACT:** Paul H. Vandiver (202) 376-6214.

**SUPPLEMENTARY INFORMATION:** On February 18, 1977, the Department of Labor published in the **Federal Register** (42 FR 10138) registration standards for apprenticeship programs. These standards, in the form of the addition of a new Part 29 to 29 CFR Subtitle A, were promulgated pursuant to the authority of section 1 of the National Apprenticeship Act of 1937 (29 U.S.C. 50), Reorganization Plan No. 14 of 1950 (64 Stat. 1267; 3 CFR 1949–53 Comp., p. 1007), the Copeland Act (40 U.S.C. 276c), and 5 U.S.C. 301.

Part 29 sets forth labor standards, policies, and procedures relating to the registration, cancellation, and deregistration of apprenticeship programs and agreements by the Bureau of Apprenticeship and Training (BAT), the recognition of a State Apprenticeship Council or agency (SAC) as the appropriate agency for registering local apprenticeship programs for certain Federal purposes, the derecognition of a SAC, and the criteria for apprenticeable occupations.

It has been the policy of BAT over the past 42 years to rely upon the comments and recommendations of private industry, labor and management organizations, and governmental agencies in determining the apprenticeability of occupations. In addition to the procedures followed by BAT, each State or territorial apprenticeship agency has the preogative of declaring an occupation to be apprenticeable. This has resulted in substantial variancies from State to State in the interpretation of the various criteria and in applying the criteria for apprenticeability.

Appendix A is published herein for comment prior to final publication as the first step in the development of a nationally recognized listing of apprenticeable occupations. Additional listings will be published from time to time as other occupations are reviewed and analyzed in accordance with the criteria established by § 29.4. All such additional listings will be published for comment prior to final publication.

Therefore, it is proposed to amend Title 29, CFR, Part 29, by adding Appendix A, which would read as follows:

*Appendix A.—List of Occupations Meeting the Criteria for Apprenticeability*

| Occupations | Dictionary of occupational titles (DOT) code No. |
|---|---|
| Accordion Maker (musical inst.) | 730.281-010 |
| Acoustical Carpenter (const.) | [illegible] |
| Air-Conditioning Installer-Servicer, Window Unit (any indus.) | 637.261-010 |
| Air-Conditioning Mechanic (auto. serv.) (Automotive Specialty Shops only) | 620.281-010 |
| Aircraft-Armament Mechanic (gov. serv.) | 632.261-010 |
| Aircraft Lay-Out Worker (aircraft-aerospace mfg.) | [illegible] |
| Aircraft Mechanic, Armament (aircraft-aerospace mfg.) | 806.381-010 |
| Aircraft Mechanic, Electrical and Radio (aircraft-aerospace mfg.) | 825.381-010 |
| Aircraft Mechanic, Plumbing and Hydraulics (aircraft-aerospace mfg.) | 862.381-010 |
| Aircraft-Photographic-Equipment Mechanic (photo. app.) | 714.281-010 |
| Airframe-and-Power Plant Mechanic (aircraft-aerospace mfg.; air trans.) | 621.281-014 |
| Airplane Coverer (aircraft-aerospace mfg.; air trans.) | 849.381-010 |
| Airplane Woodworker (aircraft-aerospace mfg.) | 769.281-010 |
| Alarm Operator (gov. serv.) | 379.162-010 |
| Animal Trainer (amuse. & rec.) | 159.224-010 |
| Artificial-Glass-Eye Maker (optical goods) | 713.261-010 |
| Artificial-Plastic-Eye Maker (optical goods) | 713.261-014 |
| Asphalt-Paving Machine Operator (const.) | 853.663-010 |
| Assembler (jewelry) | 700.684-014 |
| Assembler, Aircraft, Power Plant (aircraft-aerospace mfg.) | 806.381-022 |
| Assembler, Aircraft, Structures and Surfaces (aircraft-aerospace mfg.) | 806.381-026 |
| Assembler, Electro-Mechanical (aircraft-aerospace mfg.) | 806.381-030 |
| Assembler-Installer, General (aircraft-aerospace mfg.) | 806.381-014 |
| Assembly Mechanic, Experimental Aircraft (aircraft-aerospace mfg.) | 806.381-038 |
| Assembly Technician (office machines) | 633.261-010 |
| Audio Operator (radio & tv broad.) | 194.262-010 |
| Audio-Video Repairer (any indus.) | 729.281-010 |
| Auger Press Operator, Manual Control (brick & tile) | 575.462-010 |
| Automated Equipment Engineer-Technician (mach. mfg.) | 638.261-010 |
| Automatic-Equipment Technician (tel. & tel.) | 822.281-010 |
| Automobile-Body Repairer (auto. serv.) | 807.381-010 |
| Automobile Mechanic (auto. serv.) | 620.261-010 |
| Automobile-Radiator Mechanic (auto. serv.) (Automotive Specialty Shops only) | 620.381-010 |
| Automobile-Repair-Service Estimator (auto. serv.) | 620.261-018 |
| Automobile Tester (auto. serv.) | 620.261-014 |
| Automobile Upholsterer (auto. serv.) | 780.381-010 |
| Automotive Cooling System Diagnostic Technician (auto. serv.) (Automotive Specialty Shops only) | 620.261-580 |
| Automotive-Generator-and-Starter Repairer (auto. serv.) | 721.281-010 |
| Automotive Maintenance Equipment Servicer (any indus.) | 620.281-018 |
| Avionics Technician (aircraft-aerospace mfg.; air trans.) | 823.261-010 |
| Baker (bake. prod.) | 526.381-010 |
| Baker (hotel & rest.) | 313.381-010 |
| Baker, Pizza (hotel & rest.) | 313.381-014 |
| Bakery-Machine Mechanic (bake. prod.) | 629.281-010 |
| Bank-Note Designer (gov. serv.) | 142.061-010 |
| Barber (pers. serv.) | 330.371-010 |
| Batch-and-Furnace Operator (glass mfg.) | 572.382-010 |
| Battery Repairer (any indus.) | 727.381-014 |
| Beekeeper (agric.) | 413.161-010 |
| Bench Hand (jewelry) | 735.381-010 |
| Ben-Day Artist (print. & pub.) | 970.381-010 |
| Biomedical Equipment Technician (inst. & app.; med. serv.) | 719.261-010 |
| Blacksmith (forging) | 610.381-010 |
| Blocker-and-Cutter, Contact Lens (optical goods) | 716.681-010 |
| Boatbuilder, Wood (ship & boat bldg. & rep.) | 860.381-018 |
| Boilerhouse Mechanic (any indus.) | 805.361-010 |
| Boilermaker Fitter (boilermaker) | 805.361-014 |
| Boilermaker I (boilermaking) | 805.261-014 |
| Boilermaker II (boilermaking) | 805.381-010 |
| Boiler Operator (any indus.) | 950.382-010 |
| Bookbinder (print. & pub.) | 977.381-010 |
| Bootmaker, Hand (rubber goods) | 753.381-010 |

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Authority: Sec. 1, 50 Stat. 664, as amended (29 U.S.C. 50; 40 U.S.C. 276c; 5 U.S.C. 301); Reorganization Plan No 14 of 1950, 64 Stat. 1267 (5 U.S.C. App., p. 534).

Appendix A.—*List of Occupations Meeting the Criteria for Apprenticeability*—Continued

| Occupations | Dictionary of occupational titles (DOT) code No. |
|---|---|
| Bracelet and Brooch Maker (jewelry) | 700.681-010 |
| Brake Repairer (auto. serv.) | 620.281-026 |
| Bricklayer (brick & tile) | 861.381-014 |
| Bricklayer (const.) | 861.381-018 |
| Bricklayer, Firebrick and Refractory Tile (const.) | 861.381-026 |
| Brilliandeer-Lopper (jewelry) | 770.261-010 |
| Butcher, All-Round (slaughter. & meat packing) | 525.381-014 |
| Butcher, Meat (hotel & rest.) | 316.681-010 |
| Buttermaker (dairy prod.) | 529.362-010 |
| Cabinetmaker (woodworking) | 660.280-010 |
| Cable Installer-Repairer (light, heat & power) | 821.361-010 |
| Cable Splicer (const.; light, heat, power; tel. & tel.) | 829.361-010 |
| Cable Tester (tel. & tel.) | 822.361-010 |
| Calibration Laboratory Technician (aircraft-aerospace mfg.; electronics) | 019.281-010 |
| Camera Repairer (photographic app.) | 714.281-014 |
| Canal-Equipment Mechanic (waterworks) | 899.281-010 |
| Candy Maker (confec.) | 529.361-014 |
| Canvas Worker (canvas goods; ship & boat bldg. & rep.) | 739.381-010 |
| Car Repairer (r.r. equip.; & car bldg. & rep.) | 622.381-014 |
| Carburetor Mechanic (auto. serv.) | 620.281-034 |
| Card Cutter, Jacquard (narrow fabric; textile) | 683.582-010 |
| Card Grinder (asbestos prod.; textile) | 680.380-010 |
| Carpenter (const.) | 860.381-022 |
| Carpenter, Maintenance (any indus.) | 860.281-010 |
| Carpenter, Mold (brick & tile; conc. prod.) | 860.381-034 |
| Carpenter, Rough (const.) | 860.381-042 |
| Carpenter, Ship (water trans.) | 860.281-014 |
| Carpet Cutter (ret. tr.) | 929.381-010 |
| Carpet Layer (ret. tr.) | 864.381-010 |
| Carver, Hand (furn.; plan. mill) | 761.281-010 |
| Cash-Register Servicer (any indus.) | 633.281-010 |
| Casing-in-Line Setter (print. & pub.) | 653.360-010 |
| Casket Assembler (mort. goods) | 739.481-010 |
| Caster (jewelry) | 502.381-010 |
| Caster (nonfer. metal alloy) | 502.382-010 |
| Cell Maker (chem.) | 844.621-010 |
| Cement Mason (const.) | 844.364-010 |
| Central Office Installer (tel. & tel.) | 822.381-014 |
| Central Office Repairer (tel. & tel.) | 822.281-014 |
| Chaser (jewelry; silverware) | 704.381-010 |
| Cheesemaker (dairy prod.) | 529.361-018 |
| Chemical-Engineering Technician (profess. & kin.) | 008.261-010 |
| Chemical Laboratory Technician (profess. & kin.) | 022.261-010 |
| Chemical Operator III (chem.) | 559.382-018 |
| Chief of Party (profess. & kin.) | 018.167-010 |
| Chief Operator (chem.) | 558.260-010 |
| Civil Engineer (profess. & kin.) | 005.261-014 |
| Clarifying-Plant Operator (textile) | 955.362-010 |
| Cloth Designer (profess. & kin.) | 142.061-014 |
| Coin-Machine-Service Repairer (coin mach.) | 639.281-014 |
| Colorist, Photography (photofinish.) | 970.381-010 |
| Commercial Designer (profess. & kin.) | 141.081-014 |
| Complaint Inspector (light, heat & power) | 829.261-010 |
| Composing-Room Machinist (print. & pub.) | 627.261-010 |
| Compositor (print. & pub.) | 973.381-010 |
| Computer-Peripheral-Equipment Operator (clerical) | 213.382-010 |
| Construction-Equipment Mechanic (const.) | 620.261-022 |
| Contour Wire Specialist, Denture (medical serv.) | 712.381-014 |
| Conveyor-Maintenance Mechanic (any indus.) | 630.281-010 |
| Cook (any indus.) | 315.361-010 |
| Cook (hotel & rest.) | 313.361-014 |
| Cook, Pastry (hotel & rest.) | 313.381-026 |
| Coppersmith (ship & boat bldg. & rep.) | 862.281-010 |
| Coremaker (foundry) | 518.381-014 |
| Cork Insulator, Refrigeration Plant (const.) | 863.381-010 |
| Corrosion-Control Fitter (light, heat & power; pipe lines) | 820.361-010 |
| Cosmetologist (pers. serv.) | 332.271-010 |
| Custom Tailor (garment; pers. serv.; ret. tr.) | 785.261-014 |
| Cutter, Fabrics and Materials (aircraft-aerospace mfg.) | 781.384-010 |
| Cylinder Grinder (print. & pub.) | 500.381-010 |
| Cylinder-Press Operator (print. & pub.) | 651.362-010 |
| Dairy-Equipment Repairer (dairy prod.) | 629.281-018 |
| Decorator (any indus.) | 298.381-010 |
| Decorator (glass mfg.; glass prod.) | 740.381-010 |
| Dental Assistant (medical serv.) | 079.371-010 |
| Dental Ceramist (medical serv.) | 712.281-010 |
| Dental-Equipment Installer and Servicer (whole. tr.) | 829.261-014 |
| Dental Laboratory Technician (medical serv.) | 712.381-018 |
| Design Drafter, Electromechanisms (profess. & kin.) | 017.261-014 |
| Designer and Patternmaker (boot & shoe) | 788.281-010 |
| Detailer (profess. & kin.) | 017.261-018 |
| Diamond Selector (jewelry) | 770.281-010 |
| Dictating-Transcribing-Machine Servicer (any indus.) | 633.281-014 |
| Die Designer (mach. shop) | 007.161-010 |
| Die Finisher (mach. shop) | 601.381-010 |
| Die Maker (jewelry) | 601.381-014 |
| Die Maker (paper goods) | 739.381-018 |
| Die Maker, Bench, Stamping (mach. shop) | 601.281-010 |
| Die Maker, Stamping (mach. shop) | 601.280-010 |
| Die Maker, Trim (mach. shop) | 601.280-014 |
| Die Maker, Wire Drawing (mach. shop) | 601.280-018 |
| Die Polisher (wire) | 601.381-018 |
| Diesel-Engine Tester (engine & turbine) | 625.261-010 |
| Diesel Mechanic (any indus.) | 625.281-010 |
| Die Setter (forging) | 612.360-010 |
| Die Sinker (mach. shop) | 601.280-022 |
| Dietetic Intern (profess. & kin.) | 077.167-010 |
| Director, Funeral (pers. serv.) | 187.167-030 |
| Display Designer (profess. & kin.) | 142.051-010 |
| Displayer, Merchandise (ret. tr.) | 298.081-010 |
| Door-Closer Mechanic (any indus.) | 630.381-014 |
| Drafter, Architectural (profess. & kin.) | 001.261-010 |
| Drafter, Automotive Design (auto. mfg.) | 017.281-022 |
| Drafter, Automotive Design Lay-Out (auto. mfg.) | 017.281-026 |
| Drafter, Cartographic (profess. & kin.) | 018.261-010 |
| Drafter, Civil (profess. & kin.) | 005.281-010 |
| Drafter, Commercial (profess. & kin.) | 017.261-026 |
| Drafter, Detail (profess. & kin.) | 017.261-030 |
| Drafter, Electrical (profess. & kin.) | 003.281-010 |
| Drafter, Electronic (profess. & kin.) | 003.281-014 |
| Drafter, Heating and Ventilating (profess. & kin.) | 017.261-034 |
| Drafter, Landscape (profess. & kin.) | 001.261-014 |
| Drafter, Marine (profess. & kin.) | 014.281-010 |
| Drafter, Mechanical (profess. & kin.) | 007.281-010 |
| Drafter, Plumbing (profess. & kin.) | 017.261-038 |
| Drafter, Structural (profess. & kin.) | 005.281-014 |
| Drafter, Tool Design (profess. & kin.) | 007.261-022 |
| Drafter, Topographical (profess. & kin.) | 018.281-014 |
| Dragline Operator (any indus.) | 850.683-018 |
| Dredge Operator (const.; mining & quarrying) | 850.663-010 |
| Dressmaker (any indus.) | 785.361-010 |
| Drilling-Machine Operator (mining & quarrying) | 930.482-010 |
| Dry Cleaner (clean., dye. & press.) | 362.382-014 |
| Dry-Wall Applicator (const.; mfd. bldgs.) | 842.081-010 |
| Editor, Film (motion pic.; radio & tv broad.) | 962.264-010 |
| Electrical-Appliance Repairer (any indus.) | 723.381-010 |
| Electrical-Appliance Servicer (any indus.) | 827.261-010 |
| Electrical-Instrument Repairer (any indus.) | 729.281-026 |
| Electrical Repairer (any indus.) | 829.281-014 |
| Electrical Technician (profess. & kin.) | 003.161-010 |
| Electric-Distribution Checker (const.; light, heat & power) | 824.281-014 |
| Electrician (any indus.) | 824.261-010 |
| Electrician (ship & boat bldg. & rep.) | 825.381-030 |
| Electrician (water trans.) | 825.281-014 |
| Electrician, Airplane (aircraft-aerospace mfg.) | 825.281-018 |
| Electrician, Automotive (auto. serv.) | 825.281-022 |
| Electrician, Locomotive (loco. & car bldg. & rep.) | 825.281-026 |
| Electrician, Powerhouse (light, heat, & power) | 820.261-014 |
| Electrician, Radio (any indus.) | 823.281-014 |
| Electrician, Substation (light, heat, & power) | 820.261-018 |
| Electric-Meter Installer I (light, heat, & power) | 821.361-014 |
| Electric-Meter Repairer (light, heat, & power) | 729.281-014 |
| Electric-Meter Tester (light, heat, & power) | 821.381-010 |
| Electric-Motor-and-Generator Assembler (elec. equip.) | 820.361-014 |
| Electric-Motor Assembler and Tester (any indus.) | 721.281-014 |
| Electric-Motor Repairer (any indus.) | 721.281-018 |
| Electric-Tool Repairer (any indus.) | 729.281-022 |
| Electric-Track-Switch Maintainer (r.r. trans.) | 825.261-010 |
| Electromechanical Technician (inst. & app.) | 710.281-018 |
| Electromedical-Equipment Repairer (any indus.) | 729.281-030 |
| Electronic-Organ Technician (any indus.) | 828.261-010 |
| Electronic-Production-Line-Maintenance Mechanic (electronics) | 829.281-022 |
| Electronic Sales and Service Technician (profess. & kin.) | 828.251-010 |
| Electronics Mechanic (any indus.) | 828.281-010 |
| Electronics Technician (profess. & kin.) | 003.161-014 |
| Electronics Tester (electronics) | 726.281-014 |
| Electronics-Utility Worker (electronics) | 726.361-010 |
| Electrotyper (print. & pub.) | 974.381-010 |
| Elevating-Grader Operator (const.) | 850.663-014 |
| Elevator Constructor (const.) | 825.361-010 |
| Elevator Repairer (any indus.) | 825.281-030 |
| Embalmer (pers. serv.) | 338.371-014 |
| Embosser (print. & pub.) | 659.382-010 |
| Emergency Medical Technician (medical serv.) | 079.374-010 |
| Emergency Medical Technician, Ambulance (medical serv.) | 335.374-010 |
| Engineering Assistant, Mechanical Equipment (profess. & kin.) | 007.161-018 |
| Engineering Model Maker (inst. & app.) | 600.260-010 |
| Engine-Lathe Set-Up Operator (mach. shop) | 604.380-018 |
| Engine-Lathe Set-Up Operator, Tool (mach. shop) | 604.280-010 |
| Engine Repairer, Service (engine & turbine) | 625.281-018 |
| Engine Turner (jewelry) | 704.381-018 |
| Engraver (glass prod.; mirror) | 775.381-010 |
| Engraver I (print. & pub.) | 979.381-010 |
| Engraver, Block (print. & pub.) | 979.281-014 |
| Engraver, Hand, Hard Metals (engraving) | 704.381-026 |
| Engraver, Hand, Soft Metals (engraving) | 704.381-030 |
| Engraver, Machine (print. & pub.) | 979.382-014 |
| Engraver, Pantographic I (engraving) | 704.382-010 |
| Engraver, Picture (print. & pub.) | 979.281-018 |
| Engraving-Press Operator (print. & pub.) | 651.382-010 |
| Envelope-Folding-Machine Adjuster (paper goods) | 641.680-010 |
| Environmental-Control-System Installer-Servicer (Residential & Light Commercial) (any indus.) | 637.261-014 |
| Equipment Installer (tel. & tel.) | 822.381-010 |
| Estimator and Drafter (light, heat, & power) | 019.261-014 |
| Etcher, Hand (print. & pub.) | 971.261-010 |
| Etcher, Photoengraving (print. & pub.) | 971.381-014 |
| Experimental Assembler (any indus.) | 739.381-028 |
| Experimental Mechanic (motor & bicycles) | 600.260-014 |
| Extruder Operator (fabric.; plastics prod.; plastics mat.) | 557.382-010 |
| Fabricator-Assembler, Metal Products (any indus.) | 809.381-010 |
| Farm-Equipment Mechanic I (agric. equip.) | 624.281-010 |
| Farm-Equipment Mechanic II (agric. equip.) | 624.381-014 |
| Farmer, General (agric.) | 421.161-010 |
| Fastener Technologist (nut & bolt) | 612.260-004 |
| Field Engineer (radio & tv broad.) | 193.262-018 |
| Film Developer (motion pic.; photofinish.) | 976.382-018 |
| Film Laboratory Technician I (motion pic.) | 976.361-010 |
| Finisher, Denture (medical serv.) | 712.681-018 |
| Fire-Control Mechanic (gov. serv.) | 632.261-014 |
| Fire Fighter (any indus.) | 373.364-010 |
| Fire Fighter, Crash, Fire and Rescue (air trans.) | 373.663-010 |
| Fire Medic (medical serv.) | 373.364-010 |
| Firer, Kiln (pottery & porc.) | 573.662-010 |
| Fitter (mach. shop) | 801.381-014 |
| Fitter I (any indus.) | 801.261-014 |
| Fixture Maker (light fix.) | 600.380-010 |
| Floor-Covering Layer (loco. & car bldg. & rep.) | 622.381-026 |
| Floor Layer (const.; ret. tr.) | 864.481-010 |
| Floral Designer (ret. tr.) | 142.081-010 |
| Folding-Machine Operator (print. & pub.) | 653.382-010 |
| Folding-Machine Setter (print. & pub.) | 653.360-014 |
| Forge-Shop-Machine Repairer (forging) | 626.261-010 |
| Forging-Press Operator I (forging) | 611.482-010 |
| Form Builder (aircraft-aerospace mfg.) | 693.280-010 |
| Form Builder (const.) | 860.381-046 |
| Former, Hand (any indus.) | 619.361-010 |
| Forming-Machine Operator (glass mfg.) | 575.382-014 |
| Foundry Metallurgist (foundry) | 011.061-010 |
| Fourdrinier-Machine Tender (build. board; paper & pulp) | 539.362-014 |
| Four-Slide-Machine Setter (any indus.) | 616.380-010 |
| Freezer Operator (dairy prod.) | 529.482-010 |
| Fretted-Instrument Repairer (any indus.) | 730.281-026 |
| Front-End Mechanic (auto. serv.) | 620.281-038 |
| Fuel-Injection Servicer (any indus.) | 625.281-022 |
| Fur Cutter (fur goods) | 783.381-010 |
| Fur Designer (fur goods) | 142.081-014 |
| Fur Finisher (fur goods) | 783.381-014 |
| Furnace Installer (light, heat & power) | 862.361-010 |
| Furnace Installer-and-Repairer, Hot Air (any indus.) | 869.281-010 |

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*Appendix A.—List of Occupations Meeting the Criteria for Apprenticeability—Continued*

| Occupations | Dictionary of occupational titles (DOT) code No. |
|---|---|
| Furnace Operator (found.; iron & steel) | 512.362-018 |
| Furniture Designer (furn.) | 142.081-022 |
| Furniture Finisher (woodworking) | 763.381-010 |
| Furniture Upholsterer (any indus.) | 780.381-018 |
| Furrier (fur goods) | 783.261-010 |
| Gager (petrol. prod.; petrol. refin.; pipe lines) | 914.384-010 |
| Gang Sawyer, Stone (stonework) | 670.362-010 |
| Gas-Appliance Servicer (any indus.) | 637.261-018 |
| Gas-Engine Repairer (any indus.) | 625.281-026 |
| Gas-Main Fitter (light, heat, & power) | 862.361-014 |
| Gas-Meter Mechanic I (light, heat, & power) | 710.281-022 |
| Gas-Regulator Repairer (light, heat, & power; petrol. refin.; pipelines) | 710.381-026 |
| Gear-Cutting-Machine Set-Up Operator (mach. shop) | 602.380-010 |
| Gear-Cutting-Machine Set-Up Operator, Tool (mach. shop) | 602.260-010 |
| Gear Hobber Set-Up Operator (mach. shop) | 602.382-010 |
| Gem Cutter (jewelry) | 770.281-014 |
| General Manager, Farm (agric.; whole. tr.) | 180.167-018 |
| Geodetic Computer (profess. & kind.) | 018.167-014 |
| Glass Bender (signs) | 772.381-010 |
| Glass Blower (glass mfg.) | 772.681-010 |
| Glass Blower, Laboratory Apparatus (glass prod.; inst. & app.) | 772.281-010 |
| Glass-Blowing-Lathe Operator (glass prod.) | 772.482-010 |
| Glazier (const.) | 865.381-010 |
| Glazier, Stained Glass (glass prod.) | 779.381-010 |
| Graphic Designer (profess. & kind.) | 141.061-018 |
| Grinder I (clock & watch) | 603.482-030 |
| Grinder Operator, Tool (mach. shop) | 603.280-018 |
| Grinder Set-Up Operator, Universal (mach. shop) | 603.280-030 |
| Gunsmith (any indus.) | 632.281-010 |
| Harness Maker (leather prod.; ret. tr.) | 783.381-018 |
| Harpsichord Maker (musical inst.) | 730.281-034 |
| Hat Block Maker (woodworking) | 661.381-010 |
| Heat Transfer Technician (profess. & kind.) | 007.181-010 |
| Heat Treater I (heat treat.) | 504.382-014 |
| Heavy Forger (forging) | 612.361-010 |
| Horseshoer (agric.) | 418.381-010 |
| Horticulturist (profess. & kind.) | 040.061-038 |
| Hydraulic-Press Servicer (ammunition) | 626.381-018 |
| Hydroelectric Machinery Mechanic (light, heat & power) | 631.281-010 |
| Hydroelectric-Station Operator (light, heat, & power) | 952.362-018 |
| Hydrometer Calibrator (inst. & app.) | 710.381-030 |
| Illustrator (profess. & kind.) | 141.061-022 |
| Industrial Engineering technician (profess. & kind.) | 012.267-010 |
| Injection-Molding-Machine Operator (fabric. plastics prod.) | 556.382-014 |
| Inspector, Mechanical and Electrical (inst. & app.) | 710.381-038 |
| Inspector, Quality Assurance (gov. serv.) | 168.287-014 |
| Instrumentation Technician (profess. & kind.) | 003.261-010 |
| Instrument Maker (any indus.) | 600.280-010 |
| Instrument Maker and Repairer (petrol. prod.) | 600.280-014 |
| Instrument Mechanic (any indus.) | 710.281-026 |
| Instrument Mechanic, Weapons System (inst. & app.) | 711.281-014 |
| Instrument Repairer (any indus.) | 710.261-010 |
| Instrument technician (light, heat, & power) | 710.281-030 |
| Insulation Worker (const.) | 863.364-580 |
| Interior Designer (profess. & kind.) | 142.051-014 |
| Jacquard Loom Weaver (textile) | 683.662-010 |
| Jacquard-Plate Maker (knit goods) | 685.381-010 |
| Jeweler (jewelry) | 700.281-010 |
| Jig Builder (wood box) | 761.381-014 |
| Job Printer (print. & pub.) | 973.381-018 |
| Job Setter (fabric. plastics prod.; mach. mfg.; mach. shop) | 600.360-014 |
| Joiner (ship & boat bldg. & rep.) | 860.381-050 |
| Kick Press Setter (button) | 617.360-010 |
| Kiln Operator (woodworking) | 563.382-010 |
| Knitter mechanic (knit goods) | 685.360-010 |
| Knitting Machine Fixer (hosiery; knit goods) | 689.260-014 |
| Laboratory Assistant (light, heat, & power) | 029.381-018 |
| Laboratory Technician (auto. mfg.) | 019.381-010 |
| Laboratory Tester (any indus.) | 029.261-010 |
| Landscape Gardner (agric.) | 408.161-010 |
| Land Surveyor (profess. & kind.) | 018.167-018 |
| Last-Model Maker (lasts & rel. forms) | 761.381-018 |
| Lather (const.) | 842.361-010 |
| Laundry Machine Mechanic (laund.) | 629.261-010 |
| Lay-Out Technician (optical goods) | 716.381-014 |
| Lay-Out Worker I (any indus.) | 809.381-010 |
| Lead Burner (welding) | 819.281-010 |
| Leather Stamper (leather prod.) | 781.381-018 |
| Legal Secretary (clerical) | 201.362-010 |
| Letterer (profess. & kind.) | 970.661-014 |
| Light Technician (motion pic.; radio & tv broad.) | 962.362-014 |
| Line Erector (const.; light, heat, & power) | 821.361-018 |
| Line Installer-Repairer (tel. & tel.) | 822.381-014 |
| Line Maintainer (any indus.) | 821.261-014 |
| Liner (pottery & porc.) | 740.681-010 |
| Line Repairer (light, heat, & power) | 821.361-026 |
| Linotype Operator (print. & pub.) | 650.582-010 |
| Lithographic Plate Maker (print. & pub.) | 972.381-010 |
| Lithographic-Press Operator, Tinware (tinware) | 651.382-014 |
| Livestock Rancher (agric.) | 410.161-018 |
| Locksmith (any indus.) | 709.281-010 |
| Locomotive Engineer (r.r. trans.) | 910.363-014 |
| Loft Worker (ship & boat bldg. & rep.) | 661.281-010 |
| Logging-Equipment Mechanic (logging) | 620.281-042 |
| Loom Fixer (asbestos prod.; narrow fab.; textile) | 683.260-018 |
| Machine Assembler (mach. mfg.) | 638.361-010 |
| Machine Builder (mach. mfg.; mach. tool & access.) | 600.281-022 |
| Machine Fixer (carpet & rug) | 628.281-010 |
| Machine Fixer (textile) | 689.260-010 |
| Machine Operator I (any indus.) | 616.380-018 |
| Machine Repairer, Maintenance (any indus.) | 626.261-010 |
| Machinery Erector (engine & turbine; mach. mfg.) | 638.261-014 |
| Machine Setter (any indus.) | 616.360-022 |
| Machine Setter (clock & watch) | 600.360-022 |
| Machine Setter (woodworking) | 669.280-010 |
| Machine Set-Up Operator (elec. equip.; firearms; mach. shop) | 600.380-018 |
| Machine Set-Up Operator, Paper Goods (paper goods) | 649.380-010 |
| Machine Try-Out Setter (mach. tool & access.) | 600.360-010 |
| Machinist (mach. shop) | 600.280-022 |
| Machinist, Automotive (auto serv.) | 600.280-034 |
| Machinist, Experimental (mach. shop) | 600.260-038 |
| Machinist, Linotype (print. & pub.) | 627.261-022 |
| Machinist, Marine Engine (ship & boat bldg. & rep.) | 623.281-026 |
| Machinist, Motion-Picture Equipment (motion pic.; photo. app.) | 714.281-018 |
| Machinist, Outside (ship & boat bldg. & rep.) | 623.281-030 |
| Machinist, Wood (woodworking) | 669.380-014 |
| Maintenance Machinist (any indus.) | 600.280-042 |
| Maintenance Mechanic (any indus.) | 638.281-014 |
| Maintenance Mechanic (const.; petrol. prod.; pipe lines) | 620.281-046 |
| Maintenance Mechanic (grain & feed mill) | 629.281-030 |
| Maintenance Mechanic, Compressed-Gas Plant (comp. & liquefied gases) | 630.281-010 |
| Maintenance Mechanic, Telephone (any indus.) | 822.281-018 |
| Maintenance Repairer, Building (any indus.) | 899.381-010 |
| Maintenance Repairer, Factory or Mill (any indus.) | 899.261-014 |
| Manufacturer's Representative (whole. tr.) | 279.157-010 |
| Marble Setter (const.) | 861.381-030 |
| Material Coordinator (clerical) | 221.167-014 |
| Mechanic, Aircraft Accessories (aircraft-aerospace mfg.) | 621.281-014 |
| Mechanical-Engineering Technician (profess. & kind.) | 007.161-026 |
| Mechanical-Unit Repairer (auto. serv.; loco. & car bldg. & rep.) | 620.381-018 |
| Mechanic, Endless Track Vehicle (auto serv.) | 620.381-014 |
| Mechanic, Field and Service (aircraft-aerospace mfg.) | 621.281-030 |
| Mechanic, Industrial Truck (any indus.) | 620.281-050 |
| Medical-Apparatus Model Maker (inst. & app.) | 712.261-010 |
| Medical Laboratory Technician (medical serv.) | 078.381-014 |
| Medical Secretary (medical serv.) | 201.362-014 |
| Metal Fabricator (any indus.) | 619.360-014 |
| Meteorological Equipment Repairer (any indus.) | 823.281-018 |
| Meteorologist (profess. & kind.) | 025.062-010 |
| Meter Repairer (any indus.) | 710.281-034 |
| Miller, Wet Process (corn prod.) | 521.682-010 |
| Milling-Machine Set-Up Operator I (mach. shop) | 605.280-010 |
| Millwright (any indus.) | 638.281-018 |
| Mine-Car Repairer (mining & quarrying) | 622.381-030 |
| Miner I (mining & quarrying) | 939.281-010 |
| Mock-Up Builder (aircraft-aerospace mfg.) | 693.381-014 |
| Model and Mold Maker (brick & tile) | 777.381-014 |
| Model and Mold Maker, Plaster (porc. prod.) | 777.381-018 |
| Model Builder (furn.) | 709.381-014 |
| Model Maker (aircraft-aerospace mfg.) | 693.361-010 |
| Model Maker (clock & watch) | 693.360-010 |
| Model Maker (jewelry) | 709.381-018 |
| Model Maker (pottery & porc.) | 777.261-014 |
| Model Maker, Firearms (firearms) | 600.260-018 |
| Model Maker, Wood (any indus.) | 661.380-010 |
| Molder (foundry) | 518.361-010 |
| Molder, Pattern (foundry) | 693.381-022 |
| Mold Maker (pottery & porc.) | 777.681-010 |
| Mold Maker I (jewelry) | 700.381-034 |
| Mold Maker II (jewelry) | 777.381-022 |
| Mold Maker, Die Casting & Plastic Molding (mach. shop) | 601.280-030 |
| Mold Setter (fabric. plastics prod.; phonograph) | 556.380-010 |
| Monotype-Keyboard Operator (print. & pub.; type founding) | 650.582-014 |
| Monument Setter (const.) | 861.381-014 |
| Mosaic Worker (glass prod.; clst. & art goods) | 779.381-014 |
| Motorboat Mechanic (engine & turbine; ship & boat bldg. & rep.) | 623.281-038 |
| Motorcycle Repairer (auto. serv.) | 620.281-054 |
| Motor-Grader Operator (const.) | 850.663-022 |
| Multi-Operation-Forming Machine Setter (any indus.) | 616.260-014 |
| Multi-Operation-Machine Operator (any indus.) | 612.462-010 |
| Neon-Sign Servicer (signs) | 824.281-018 |
| Numerical-Control-Machine Operator (mach. shop) | 609.662-010 |
| Office-Machine Servicer (any indus.) | 633.281-018 |
| Offset-Plate Maker (print. & pub.) | 971.381-018 |
| Offset-Press Operator I (print. & pub.) | 651.482-010 |
| Oil-Burner-Servicer and Installer (any indus.) | 862.281-018 |
| Oil-Field Equipment Mechanic (petrol. prod.) | 629.381-014 |
| Optical-Instrument Assembler (optical goods) | 711.381-010 |
| Optician (optical goods) | 716.280-008 |
| Optician (optical goods; ret. tr.) | 716.280-014 |
| Optician, Dispensing I (ret. tr.) | 713.361-014 |
| Optician, Dispensing II (ret. tr.) | 299.474-010 |
| Optomechanical Technician (optical goods; photo. app.) | 007.161-030 |
| Ordnance Artificer (gov. serv.) | 632.261-018 |
| Ornamental-Iron Worker (const.) | 809.381-022 |
| Ornamental-Metal Worker (fabric. metal prod., not elsewhere classified) | 619.260-008 |
| Orthodontic Technician (medical serv.) | 712.381-030 |
| Orthopedic-Boot-and-Shoe Designer and Maker (boot & shoe; pers. protec. medical dev.) | 788.261-010 |
| Orthotics Technician (pers. protec.; medical dev.) | 712.381-034 |
| Orthotist (pers. protec.; medical dev.) | 078.261-018 |
| Outboard-Motor Mechanic (engine & turbine) | 623.281-042 |
| Outside Production Inspector (aircraft-aerospace mfg.) | 806.261-046 |
| Overhauler (textile) | 629.261-010 |
| Painter (const.) | 840.381-010 |
| Painter, Hand (any indus.) | 970.381-022 |
| Painter, Shipyard (ship & boat bldg. & rep.) | 840.381-018 |
| Painter, Sign (any indus.) | 970.381-026 |
| Painter, Transportation Equipment (aircraft-aerospace mfg.; air trans.; auto serv.) | 845.381-014 |
| Pantograph-Machine Set-Up Operator (mach. shop) | 605.382-022 |
| Paperhanger (const.) | 841.381-010 |
| Paste-Up Copy-Camera Operator (print. & pub.) | 979.381-018 |
| Patternmaker (furn.; garment; tex. prod., not elsewhere classified) | 781.381-026 |
| Patternmaker (spring) | 693.261-014 |
| Patternmaker (stonework) | 703.381-010 |
| Patternmaker, Metal (foundry) | 600.280-050 |
| Patternmaker, Metal, Bench (foundry) | 693.281-018 |
| Patternmaker, Plaster (aircraft-aerospace mfg.) | 777.381-030 |
| Patternmaker, Plastics (fabric. plastics prod.) | 754.381-014 |
| Patternmaker, Wood (foundry) | 661.281-022 |
| Photocomposing-Perforator-Machine Operator (print. & pub.) | 650.582-042 |
| Photoengraver (print. & pub.) | 971.381-022 |

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*Appendix A.—List of Occupations Meeting the Criteria for Apprenticeability—Continued*

| Occupations | Dictionary of occupational titles (DOT) code No. |
|---|---|
| Photoengraving Finisher (print. & pub.) | 971.381-030 |
| Photoengraving Printer (print. & pub.) | 971.381-034 |
| Photoengraving Proofer (print. & pub.) | 971.381-038 |
| Photogrammetrist (profess. & kind.) | 018.261-026 |
| Photographer, Lithographic (print. & pub.) | 972.382-014 |
| Photographer, Motion Picture (profess. & kind.) | 143.062-022 |
| Photographer, Photoengraving (electronics; print. & pub.) | 971.382-014 |
| Photographer, Still (profess. & kind.) | 143.062-030 |
| Photographic Equipment Maintenance Technician (photo. app.) | 714.281-022 |
| Photographic Equipment Technician (photo. app.) | 714.281-026 |
| Photographic Plate Maker (electronics) | 714.381-018 |
| Photograph Retoucher (photofinish) | 970.281-018 |
| Physical Therapist (medical serv.) | 076.121-014 |
| Piano Technician (any indus.) | 730.281-038 |
| Piano Tuner (any indus.) | 730.361-010 |
| Pinsetter Adjuster, Automatic (sports equip.) | 638.261-022 |
| Pipe Coverer and Insulator (ship & boat bldg. & rep.) | 863.381-014 |
| Pipefitter (const.) | 862.281-022 |
| Pipefitter (ship & boat bldg. & rep.) | 862.261-010 |
| Pipe Organ Builder (musical inst.) | 730.281-042 |
| Pipe Organ Tuner and Repairer (any indus.) | 730.361-014 |
| Plant Operator, Furnace Process ([illegible] carbon, lampblack) | 549.382-[illegible] |
| Plasterer (const.) | 842.361-018 |
| Plaster-Pattern Caster (aircraft-aerospace mfg.; mach. tools & access.) | 777.381-030 |
| Plastic-Fixture Builder (mach. shop) | 601.381-026 |
| Plastics Bench Mechanic (aircraft-aerospace mfg.; fabric. plastics prod.) | 754.381-018 |
| Plastic Tool Maker (mach. shop) | 601.381-030 |
| Plate Finisher (print. & pub.) | [illegible].380-010 |
| Platen-Press Operator (print. & pub.) | 651.362-018 |
| Plater (electroplating) | 500.380-010 |
| Plumber (const.) | 862.381-030 |
| Pneumatic Tester and Mechanic (aircraft-aerospace mfg.) | 621.381-022 |
| Pneumatic-Tool Repairer (any indus.) | 630.281-010 |
| Pneumatic-Tube Repairer (any indus.) | 630.281-014 |
| Podiatric Assistant (medical serv.) | 079.374-018 |
| Pottery-Machine Operator (pottery & porc.) | 774.382-010 |
| Powerhouse Mechanic (light, heat, & power) | 631.261-014 |
| Power-Plant Operator (light, heat, & power) | 952.382-018 |
| Power-Saw Mechanic (any indus.) | 625.281-030 |
| Power-Transformer Repairer (light, heat, & power) | 821.381-034 |
| Precision Assembler (aircraft-aerospace mfg.; electronics) | 806.381-014 |
| Precision Assembler, Bench (aircraft-aerospace mfg.) | 706.381-010 |
| Precision-Lens Grinder (optical goods) | 716.382-018 |
| Press Machinist (print. & pub.) | 627.261-010 |
| Press Operator, Heavy Duty (any indus.) | 617.260-010 |
| Printer, Plastic (coated fabric; fabric. plastics prod.) | 651.382-026 |
| Printer-Slotter Operator (paper goods) | 659.662-010 |
| Private-Branch-Exchange Installer (tel. & tel.) | 822.381-018 |
| Private-Branch-Exchange Repairer (tel. & tel.) | 822.281-022 |
| Process Artist (print. & pub.) | 972.281-010 |
| Production Engineer (profess. & kind.) | 012.167-046 |
| Programmer, Business (profess. & kind.) | 020.162-014 |
| Programmer, Engineering and Scientific (profess. & kind.) | 020.167-022 |
| Projection Printer (photofinish) | 976.381-018 |
| Proof-Press Operator (print. & pub.) | 651.582-010 |
| Proofsheet Corrector (print. & pub.) | 973.381-030 |
| Prop Maker (amuse. & rec.; motion pic.) | 962.281-010 |
| Propulsion-Motor-and-Generator Repairer (auto. serv.) | 721.281-030 |
| Prospecting Driller (petrol. prod.) | 930.382-018 |
| Prosthetics Technician (pers. protec. & medical dev.) | 712.381-038 |
| Prosthetist (pers. protec. & medical dev.) | 078.261-022 |
| Protective-Signal Installer (bus. serv.) | 822.361-018 |
| Protective-Signal Repairer (bus. serv.) | 822.361-022 |
| Pump Erector (const.) | 637.261-018 |
| Pumper-Gauger (chem.; petrol. refin.; pipe lines) | 914.382-014 |
| Pump Servicer (any indus.) | 630.281-018 |
| Purification Operator (chem.) | 551.362-018 |
| Quality-Control Inspector (cut. & tools) | 701.261-010 |
| Quality-Control Technician (profess. & kind.) | 012.261-014 |
| Radiographer (any indus.) | 199.361-010 |
| Radiologic Technologist (medical serv.) | 078.362-026 |
| Radio Mechanic (any indus.) | 823.261-018 |
| Radio Repairer (any indus.) | 720.281-010 |
| Radio Station Operator (aircraft-aerospace mfg.) | 193.262-026 |
| Recording Engineer (phonograph; radio & tv broad.) | 194.362-010 |
| Recovery Operator (paper & pulp) | 552.362-018 |
| Recreational-Vehicle Mechanic (trans. equip.) | 869.261-022 |
| Refrigeration Mechanic (any indus.) | 637.261-026 |
| Refrigeration Unit Repairer (refrig. equip.) | 637.381-014 |
| Relay Technician (light, heat, & power) | 821.261-018 |
| Relay Tester (light, heat, & power) | 729.381-030 |
| Repairer, Hand Tools (cut. & tools) | 701.381-010 |
| Repairer, Heavy (auto. mfg.) | 620.261-022 |
| Repairer I (chem.) | 630.261-018 |
| Repairer, Welding Equipment (welding) | 626.381-022 |
| Reproduction Technician (any indus.) | 976.361-010 |
| Research Mechanic (aircraft-aerospace mfg.) | 002.260-010 |
| [illegible] Inspector (spectacles; inst. & app.; optical goods) | 716.381-010 |
| Retoucher, Photoengraving (print. & pub.) | 970.381-030 |
| Rigger (any indus.) | 921.260-010 |
| Rigger (ship & boat bldg. & rep.) | 806.261-014 |
| Rocket Engine-Component Mechanic (aircraft-aerospace mfg.) | 621.281-030 |
| Rocket-Engine Mechanic (aircraft-aerospace mfg.) | 693.261-026 |
| Roller Engraver, Hand (print. & pub.) | 979.681-018 |
| Roll Threader Operator (nut & bolt) | 619.462-010 |
| Roofer (const.) | 866.381-010 |
| Rotogravure-Press Operator (print. & pub.) | 651.362-026 |
| Rubberizing Mechanic (any indus.) | 630.281-030 |
| Rubber Stamp Maker (pen & pencil) | 733.381-014 |
| Rubber Tester (rubber goods; rubber tire & tube) | 559.381-014 |
| Rug Cleaner, Hand (clean., dye., & press.) | 369.384-014 |
| Saddle Maker (leather prod.) | 783.381-022 |
| Safe-and-Vault Service Mechanic (bus. serv.; whole. tr.) | 869.381-022 |
| Salesperson, Parts (ret. tr.; whole. tr.) | 279.357-062 |
| Sample-Body Builder (auto. mfg.) | 693.380-014 |
| Sample Maker, Appliances (elec. equip.) | 600.280-054 |
| Sample Stitcher (garment) | 785.361-018 |
| Sandblaster, Stone (stonework) | 673.382-010 |
| Saw Filer (any indus.) | 701.381-014 |
| Saw Maker (cut. & tools) | 601.381-034 |
| Scale Mechanic (any indus.) | 633.281-026 |
| Screw-Machine Operator, Multiple Spindle (mach. shop) | 604.382-010 |
| Screw-Machine Operator, Single Spindle (mach. shop) | 604.382-014 |
| Screw-Machine Set-Up Operator, Production (mach. shop) | 604.380-022 |
| Screw-Machine Set-Up Operator, Single Spindle (mach. shop) | 604.280-018 |
| Service Mechanic (auto. mfg.) | 807.381-022 |
| Sewing-Machine Repairer (any indus.) | 639.281-018 |
| Sheet-Metal Worker (any indus.) | 804.281-010 |
| Shipfitter (ship & boat bldg. & rep.) | 806.381-046 |
| Shipwright (ship & boat bldg. & rep.) | 860.381-058 |
| Shoemaker, Custom (boot & shoe) | 788.381-014 |
| Shoe Repairer (pers. serv.) | 365.361-014 |
| Shop Tailor (garment; ret. tr.) | 785.361-022 |
| Siderographer (print. & pub.) | 979.381-030 |
| Signal Maintainer (rr. trans.) | 822.281-026 |
| Sign Erector I (signs) | 869.381-026 |
| Sign Writer, Hand (any indus.) | 970.281-022 |
| Silk-Screen Cutter (any indus.) | 979.681-022 |
| Silversmith (silverware) | 700.281-022 |
| Sketch Maker I (print. & pub.) | 979.381-034 |
| Sketch Maker II (print. & pub.) | 972.381-018 |
| Skin Fitter (aircraft-aerospace mfg.; air trans.) | 806.381-054 |
| Small-Engine Mechanic (any indus.) | 625.281-034 |
| Soft-Tile Setter (const.; ret. tr.) | 861.381-034 |
| Solderer (jewelry) | 700.381-050 |
| Sound Mixer (motion pic.; phonograph; radio & tv broad.) | 194.262-018 |
| Sound Technician (any indus.) | 829.281-022 |
| Spinner, Hand (any indus.) | 619.362-018 |
| Spring-Coiling-Machine Setter (spring) | 616.260-018 |
| Spring Maker (spring) | 616.280-010 |
| Spring-Manufacturing Set-Up Technician (clock & watch) | 619.280-018 |
| Spring Repairer, Hand (auto. serv.) | 619.380-018 |
| Stained Glass Artist (profess. & kind.) | 142.061-054 |
| Stationary Engineer (any indus.) | 950.382-026 |
| Stator Installer-and-Repairer (tel. & tel.) | 827.261-022 |
| Steam Service Inspector (light, heat, & power) | 862.361-022 |
| Steel-Die Printer (print. & pub.) | 651.382-030 |
| Stencil Cutter (loco. & car bldg. & rep.) | 970.381-038 |
| Stereotyper (print. & pub.) | 974.382-014 |
| Stoker Erector-and-Servicer (any indus.) | 637.281-014 |
| Stone Carver (stonework) | 771.281-014 |
| Stonecutter, Hand (stonework) | 771.381-014 |
| Stone-Lathe Operator (stonework) | 674.662-010 |
| Stonemason (const.) | 861.381-038 |
| Stone Polisher, Machine (stonework) | 673.382-018 |
| Stone Setter (jewelry; optical goods) | 700.381-054 |
| Street-Light Servicer (light, heat, & power) | 824.381-010 |
| Stripper (print. & pub.) | 971.381-050 |
| Structural-Steel Worker (const.) | 801.281-014 |
| Substation Operator (light, heat, & power) | 952.362-026 |
| Supercargo (water trans.) | 248.167-010 |
| Surface-Plate Finisher (stonework) | 775.281-010 |
| Switchboard Operator (light, heat, & power) | 952.362-034 |
| Tank Setter (petrol. prod.) | 801.361-022 |
| Tap-and-Die Maker Technician (clock & watch) | 601.280-034 |
| Tape-Recorder Repairer (any indus.) | 720.281-014 |
| Taxidermist (profess. & kind.) | 199.261-010 |
| Technician, Submarine Cable Equipment (tel. & tel.) | 822.281-034 |
| Television-and-Radio Repairer (any indus.) | 720.281-018 |
| Television-Cable Installer (any indus.) | 821.281-010 |
| Template Maker (any indus.) | 601.381-038 |
| Template Maker, Extrusion Die (mach. shop) | 601.280-038 |
| Terrazzo Worker (const.) | 861.381-046 |
| Test Engine Operator (petrol. refin.) | 629.261-018 |
| Testing-and-Regulating Technician (tel. & tel.) | 822.261-026 |
| Thermometer Tester (inst. & app.) | 710.384-030 |
| Tile Setter (const.) | 861.381-054 |
| Tinter (paint & varnish) | 550.381-014 |
| Tool-and-Die Maker (mach. shop) | 601.280-046 |
| Tool Designer (profess. & kind.) | 007.061-026 |
| Tool-Drawing Checker (aircraft-aerospace mfg.) | 007.167-022 |
| Tool Grinder I (any indus.) | 701.381-018 |
| Tool Grinder Operator (mach. shop) | 603.280-038 |
| Tool-Machine Set-Up Operator (mach. shop) | 601.280-054 |
| Tool Maker (mach. shop) | 601.280-042 |
| Tool Maker, Bench (mach. shop) | 601.281-026 |
| Tractor Mechanic (auto. serv.) | 620.281-058 |
| Transformer Repairer (any indus.) | 724.381-018 |
| Transmission Mechanic (auto. serv.) (Automotive Specialty Shops only) | 620.281-062 |
| Treatment-Plant Mechanic (waterworks) | 630.281-036 |
| Tree Surgeon (agric.) | 408.181-010 |
| Trouble Locator, Test Desk (tel. & tel.) | 822.361-030 |
| Trouble Shooter II (light, heat, & power) | 821.261-026 |
| Truck-Body Builder (auto. mfg.; auto. serv.) | 807.281-010 |
| Truck-Crane Operator (any indus.) | 921.663-062 |
| Tune-Up Mechanic (auto. serv.) | 620.281-066 |
| Turbine Operator (light, heat, & power) | 952.362-042 |
| Turret-Lathe Set-Up Operator, Tool (mach. shop) | 604.280-022 |
| Upholsterer, Inside (furn.) | 780.681-010 |
| Violin Maker, Hand (musical inst.) | 730.281-046 |
| Wallpaper Printer I (wallpaper) | 652.662-014 |
| Waste-Treatment Operator (chem.) | 955.382-014 |
| Wastewater-Treatment-Plant Operator (sanitary serv.) | 955.362-010 |
| Watch Repairer (clock & watch) | 715.281-010 |
| Water-Treatment-Plant Operator (waterworks) | 954.382-014 |
| Weather Observer (profess. & kind.) | 025.267-014 |
| Web-Press Operator (print. & pub.) | 651.362-030 |
| Welder, Arc (welding) | 810.384-014 |
| Welder, Combination (welding) | 819.384-010 |
| Welder-Fitter (welding) | 819.361-010 |
| Welding-Machine Operator, Arc (welding) | 810.382-010 |
| Well-Drill Operator (const.) | 859.362-010 |
| Wind-Instrument Repairer (any indus.) | 730.281-054 |
| Wind-Tunnel Mechanic (aircraft-aerospace mfg.) | 827.381-014 |
| Wine Maker (vinous liquors) | 183.161-014 |
| Wirer (office mach.) | 729.281-042 |
| Wire Sawyer (stonework) | 677.462-014 |
| Wire Weaver, Cloth (wirework) | 616.382-014 |
| Wood-Turning-Lathe Operator (woodworking) | 664.382-014 |
| X-Ray Equipment Tester (any indus.) | 729.281-046 |

Signed at Washington, D.C. this 28th day of February, 1980.

**Charles B. Knapp,**

*Deputy Assistant Secretary for Employment and Training Administration*

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Mr. **Brooks**. In response to the question of Congressman Erlenborn's, I would like to just call attention—and I will include in my full remarks, the entire joint memorandum to the chairman and members of the Subcommittee on Appropriations for the Department of Labor House of Representatives of 1937 submitted by Francis Perkins, then Secretary of the U.S. Office of Education, and J. C. Wright, then Assistant Commissioner for Vocational Education, a very significant statement published in 1937. And I just want to quote it from a three brief statements from this joint memorandum.

First of all, it points out, that—

> There are two distinct groups of responsibilities and functions in the promotion and subsequent operation of plans for apprentice training. One group feels with the apprentice as an employed worker, the conditions under which he works, his hours of work, his rates of pay, the length of his learning period, and the ratio of apprentices to journeymen so that overcrowding of shortages of skilled workers in the trades may be avoided in large part.
>
> The second group of responsibilities deal with the apprentice as a student. The related technical and supplemental instruction needed to make him a proficient worker and the supervision and coordination of this instruction with his job experience.

And skipping over, a continued quote:

> Partly because of lack of interest in apprenticeship on the part of employers and partly because of this lack of machinery, this vital system of training for the highly skilled trades has not kept pace either with the needs of industry or with the opportunities for employment in the skilled trades.
>
> The United States Employment Service, as a consequence, warns that unless apprentices are put on now, within a very short period of time there will be a real shortage of skilled workers in many of our most important industries.

And skipping further, and continued quote:

> It will in no way encroach upon the work now being done by the U.S. Office of Education but, on the contrary, as evidenced by the activities of the Federal Committee on Apprentice Training during the past two years, will vitalize and greatly increase the demands upon the school authorities for pre-apprenticeship training, related instruction for apprentices, coordination of this instruction with job experience, the preparation of trade analyses, and outlines of instruction, and for specially trained teachers to carry on these functions.

Again, this is from a joint memorandum of 1937. And as Dr. Bob Glover said in his opening statement, essentially in answer to a question: There has been no fulfillment of what is stated in this joint memorandum. That which I just indicated was a commitment from Francis Perkins, then Secretary, U.S. Office of Education, and J. C. Wright, Assistant Commissioner for Vocational Education, has not come to pass. And the coordination needed even today between the U.S. Department of Labor and the U.S. Department of Education to fulfill this commitment is still in the future.

There is not any evidence of any activity in a period of over 40 years—now 46 years—to fulfill the promise of this joint memorandum to the members of the Subcommittee on Appropriations in 1937.

With that, I would relinquish this opportunity to Don Grabowski, and then answer any questions you might have.

Mr. **Erlenborn** [presiding]. Mr. Grabowski.

## STATEMENT OF DONALD J. GRABOWSKI, DIRECTOR, EMPLOYABILITY DEVELOPMENT, STATE OF NEW YORK DEPARTMENT OF LABOR, ON BEHALF OF THE NATIONAL ASSOCIATION OF STATE & TERRITORIAL APPRENTICESHIP DIRECTORS

Mr. GRABOWSKI. Thank you, Mr. Chairman.

I am Donald J. Grabowski, the president of the National Association of State & Territorial Apprenticeship Directors, which is an organization of State government officials with the principal responsibility for the promotion, registration, supervision, and credentialing of apprentice training programs in their respective States and territories.

We are deeply grateful for the opportunity to present our views on apprentice training because we believe the willingness of this committee to look at apprentice training indicates that its important contributions to the Nation's skilled human resources are finally beginning to be realized.

You have heard a number of comments today which are ample evidence to what I am going to say. The problem with apprentice training is that it works. It is a silent success. And it is also one of our best kept secrets. Each month and year, thousands of apprentices complete their training, become fully skilled workers who improve the Nation's productivity through their work in meaningful career jobs. They are proficient in thousands of skilled occupations and they are the heart of the Nation's productive capacity.

As you heard earlier, the cost to Government for this array of skilled workers is minimal. Private sector program sponsors provide wages and almost all training costs. Apprentices are employed taxpayers from the first day of their enrollment.

Government's contribution to apprentice training is limited to providing staff support for the promotion, administration, supervision, and credentialing of apprenticeship. From the taxpayers' point of view, apprentice training is the most cost-efficient employment and training program operating in the Nation today.

Having said all that, Mr. Chairman, and being preceded by a number of witnesses who have given ample testimony to it of the obvious advantages of this program, yet, apprenticeship today is largely unrecognized, often misunderstood, poorly supported at both the State and Federal levels, and fragmented in its administration.

We commend the committee for its beginning of an overview which we hope will correct these shortcomings.

The first essential step to forestall this loss of apprenticeship training in our Nation is that the program be recognized by the Congress and the Department as an important component of the Nation's employment and training programs and policies.

It must be recognized as the key to skilled development and the thousands of apprentice graduates must be acknowledged as the core of our Nation's skilled worker resources and the key to improved productivity.

This simply can't happen without the action we hope the Congress will take.

We have four specific recommendations that we sincerely hope the committee will consider and the first is, to our way of thinking, the most important:

The Congress must adopt a clear, concise national policy on apprenticeship training. That policy should emphasize its importance, its costs efficiency, and stress the necessity to expand and improve the program.

You have heard comments about linkages, and we believe that the statutory language relating to apprenticeship should firmly link it with other employment training and education programs. It must have an identifiable priority among employment and training programs.

The national policy needs to go one step further, as Dr. Glover pointed out. It needs to spell out appropriate roles for Federal and State governments to insure that scarce resources are not used to perform functions best delivered at another level of government.

We in NASTAD believe that the registration of apprentices and programs, the day-to-day supervision of program operations, and the credentialing of skills and experience acquired are best performed at the State level.

U.S. Department of Labor efforts can be most effective when they are directed toward a targeted promotion of the program, the forging of linkages with other employment and training programs, which, as you have heard from previous witnesses, is a formidable task; and the provision of technical assistance and oversight to assure minimum standards on the part of the States.

There is more than enough work available for everyone, Mr. Chairman; there is no need to duplicate efforts.

NASTAD wants a strong, effective Federal/State partnership and substantial expansion of effort at both levels.

Our second recommendation concerns the need for a current reliable national apprenticeship data system.

We simply must know the kind and quality of apprentice training being conducted nationally by State, by occupation, and industry. Unless we do, we simply cannot plan and make the kinds of linkages that are so necessary to bringing this program to full fruition.

Several witnesses have commented about the relationship of apprentice training to high-tech. In New York State we have done several studies on this and we find, first of all, that apprenticeship is in fact at the heart of much high-tech industry today, as was mentioned by several previous witnesses.

It is not a question of developing a system to enhance high technology occupations. That system is already here. We need to recognize it and to expand it.

Third, and in order to get the States to establish and accept the kinds of responsibilities that they need, apprentice training incentives need to be offered to the States. As was noted by previous witnesses, some States have accepted their responsibilities, others have not yet gotten started. Some form of incentive needs to be developed so that all States will accept these obligations and allocate sufficient resources to fulfill them.

And, finally, as was noted by previous witnesses again, there is an important need for updated related instruction curriculae so that apprentices, particularly in the related-instruction portion of their programs, have the opportunity to become familiar with the latest equipment and devices, and to understand how it works.

There are a number of successful model programs already linking apprentice training with secondary and postsecondary level endeavors throughout the Nation. We need to identify those, to promote their expansion, and to provide the kind of support that is necessary so that this program can make the contribution it is able to make to our national human resources.

The temptation to leave things alone and hope for the best is very strong. But when a skilled development effort like apprentice training does not yield the benefits it could, it is indeed broken, and it needs to be fixed.

We hope that you and your colleagues, Mr. Chairman, will continue your oversight in the apprentice training area and we stand ready to work with you in your efforts to fashion appropriate improvements.

Thank you very much for the opportunity to be here.

[The prepared statement of Donald J. Grabowski follows:]

### PREPARED STATEMENT OF DONALD J. GRABOWSKI, FOR THE NATIONAL ASSOCIATION OF STATE & TERRITORIAL APPRENTICESHIP DIRECTORS

Mr. CHAIRMAN. I am Donald J. Grabowski, President of the National Association of State & Territorial Apprenticeship Directors, an organization of State Government officials with principal responsibility for the promotion, registration, supervision and credentialing of Apprentice Training programs in their States and Territories. We deeply appreciate the opportunity you and your colleagues have given us to present our views on Apprentice Training. Your willingness to review this important subject indicates that Apprentice Training's important contributions to the Nation's skilled human resources are beginning to be recognized.

Apprentice Training is a silent success—one of our best kept secrets. Each month and year thousands of apprentices complete their training and become fully skilled workers who improve the nation's productivity through their work in meaningful career jobs. They are proficient in hundreds of skilled occupations; they are the heart of our nation's productive capacity.

The cost to government for this array of skilled workers is minimal. Private sector program sponsors provide wages and almost all training costs. Apprentices are employed taxpayers from their first day of enrollment. During these proceedings, you will hear many representatives of these private sector programs who annually spend hundreds of thousands of their dollars to train the nation's future skilled workers.

Government's contribution to Apprentice Training is limited to providing staff support for the promotion, administration, supervision and credentialing of apprenticeship. From the taxpayers point of view, Apprentice Training is the most cost-efficient employment and training program operating in the nation today.

Despite these obvious advantage to all concerned, apprenticeship today is largely unrecognized, often misunderstood, poorly supported at both State and Federal levels, and fragmented in its administration. We commend you and your Committee for beginning an overview which we hope will promote efforts to correct these shortcomings.

Unless positive actions are taken at the federal level, Apprentice Training probably will continue at about current levels and fail to yield the benefits it could provide to our nation and its youth. The absolutely essential first step necessary to forestall this loss is for Apprentice Training to be recognized by the Congress and the Department of Labor as an important component of the nation's employment and training programs and policies. It must be recognized as the key to skill development, and the thousands of skilled apprentice graduates must be acknowledged as the core of our nation's skilled worker resources and the key to improved productivity. Only after that awareness becomes generally accepted throughout the nation will it be reflected in federal and state employment and training policies and planning. This cannot happen without the action by the Congress.

The Federal statute on apprentice training has remained unchanged for many years. Its existence is seldom acknowleged in employment and training legislation. Thus, Federal and State roles and responsibilities have become blurred, operating procedures often overlap, and the develop of effort from State to State is very uneven. Two decades of employment and training legislation have failed to recognize Apprentice Training as an essential component of national, state and local planning and programmatic activity. The result has been lost opportunities for youth, lost skills for our workforce and lost revenues for government.

To correct these shortcomings, we urge the adoption of the following recommendations:

(1) The Congress should adopt a clear concise national policy on apprentice training. The policy should emphasize its importance and cost efficiency, and stress the necessity to expand and improve it. Statutory language should firmly link it with other employment, training and education programs. Apprentice Training must have an identifiable priority among employment and training programs. Our national policy statement should spell out appropriate roles for federal and state government to insure that scarce resources are not used to perform functions best delivered at another level of government. For example, NASTAD believes registration of apprentices and programs, day-to-day supervision of their operations, and the credentialing of skills and experience acquired are best performed at the State level. U.S. Department of Labor efforts can be most effective when directed toward targeted promotion of the program, forging linkages with other employment and training programs under Department of Labor supervision, and the provision of technical assistance and oversight to the States. There is more than enough work available for everyone; there is not need to duplicate efforts.

(2) U.S. Department of Labor should create a current reliable national apprenticeship data system. We must know the kind and quantity of apprentice training now beng conducted nationally, by State, occupation and industry. Unless we do, planning and linkages are impossible. Furthermore, a national data system is essential to expanding skilled training in the high technology industries and growth occupations which will provide stability of employment and satisfying careers to youth while enhancing our productive capacity.

(3) The Congress should offer apprentice training incentives to all States. We should have incentives for States which already support apprenticeship staffs to expand their efforts, and encouragements for those which are not yet meeting their responsibilities. Most states have their own State Apprentice Training laws, regulations and appropriations, but some do not. Federal polices and incentives should be developed to insure that all States accept these obligations and allocate suficient resources to fulfill the. While economic self-interest probably will produce the same result over time, we cannot afford to wait if we wish to remain competitive in world markets.

(4) Federal and State educational agencies should develop updated related instruction curriculae. Apprentices must have the latest technical information in their occupations and the opportunity to use and become familiar with the electronic devices upon which tomorrow's industrial works will be built. Successful model programs linking apprentice training with secondary and college level training already exist, and offer the best practical way to meld private sector efforts with educational systems.

Selling success is not easy. The temptation to leave things alone and hope for the best is very strong. When a skill development effort like apprentice training does not yield the benefits it could, it is indeed broken, and needs to be fixed. You are to be commended, Mr. Chairman, for recognizing this fact. NASTAD is ready to work with you, your colleagues and with staff to fashion appropriate improvements. Again, our thanks for this opportunity.

### NATIONAL AND STATE GOVERNMENT APPRENTICESHIP GOALS

A primary goal in all government apprenticeship activities is the protection of apprentices and the establishment of acceptable labor standards.

There are three additional goals which government seeks for apprecticeship. They are:

#### *(1) Expansion*

Both the concept and the system of apprenticeship should be expanded throughout the public and private sector work force. Apprenticeship is a time-tested, cost-efficient training system which produces highly skilled workers to meet present and emerging state and national skill shortages. Expanded apprecticeship will increase the nation's defense capabilities, improve worker productivity and strengthen state and national competitive efforts in economic development.

*(2) Quality*

In order to be effective, apprenticeship must be a high quality program which combines learning on the job with theoretical instruction in the classroom. Since government credentials the apprenticeship experience, it's important to have a clear definition of apprenticeable occupations and a strong supervisory system to monitor the quality of the program. Quality of training is best measured by the labor and management participants through performance testing.

*(3) Access*

Governments must insure that all citizens have equal opportunity to participate in apprenticeship programs. This requires wide dissemination of information about apprenticeship opportunities and accurate statistical reporting on participation rates to identify problems and progress.

## GOVERNMENT APPRENTICE TRAINING ACTIVITIES

In order to achieve the stated goals, federal and state governments must undertake a variety of activities. Among them are:

*(1) Promotion*

This involves widespread "selling" of the concept and system of apprenticeship to provide an ever-expanding number of skilled trade training opportunities. It also includes promotional activities among the general population, especially applicant target groups, to promote general knowledge of the opportunities and understanding that they are open to all.

*(2) Development*

Sound apprenticeship programs require realistic OJT and classroom training outlines which meet minimum standards for competency in the occupation and produce workers with the skills industry requires. Training programs must clearly show what will be learned, when and how. Development of strong programs is the basis of expansion, since it illustrates what can be achieved by use of apprenticeship.

*(3) Registration*

The certification and credentialling function must accurately identify all programs and apprentices. It forms the basis for recordkeeping, compliance with laws and regulations and the issuance of government certificates.

*Servicing*

A regular physical review of apprenticeship programs and enrollees is required to insure proper program operation and to provide an opportunity to correct problems, verify and update records, note needed changes, and establish the basis for credentialling.

Mr. ERLENBORN. Thank you, and I want to thank both of you.

Let me direct a few questions to you, and either one of you may answer these, or both.

First, I think you both have made the point that the Federal Government needs to improve its administration of the Apprenticeship Act. Mr. Brooks, I think, suggested that we have personnel in the States that is duplicative and unneeded.

Let me ask: Do you think that we need for any of these purposes amendments to the basic apprenticeship law, or is it more a matter of allocation of resources rather than spelling out duties and responsibilities?

Mr. BROOKS. Mr. Congressman, the Fitzgerald Act of 1937, as you are aware, is a very brief act. It is more of an umbrella act. In fact, apprenticeship, in my estimation, would be well served by a completely new statute, spelling out much more parallel, for instance, to the Vocational Act and other educational acts, and the JTPA Act, the particulars that are anticipated for the program and the responsibilities—and including the establishment, as I will spell out in the larger expanded, extended comments that I will file with you, the establishment of an institute to help promulgate the related-instruction material that is so vitally needed.

There is so much support material that is needed for which there is no reason for the different States to duplicate effort and expense in producing the goods. This is the sort of thing that could be economically, effectively, efficiently done on a national basis for the entire country, and moreover, because of the limited resources in terms of people who are knowledgeable in these areas, capable of providing these support materials—it makes a lot of sense if we are going to do it, to combine resources and do it on a national basis.

I would much rather see major allocations of resources directed in this effort. But a national piece of legislation spelling out these functions as well as what I would contemplate the reorganization of the Bureau and essentially elevating it out of the current area of the U.S. Department of Labor in which it is located.

The problem right now, in short, if I may pick up on what some earlier speakers were saying, is that within Assistant Secretary Angrisani's division, the appropriations that have gone to CETA and JTPA, in the next biennium, essentially we are talking about $6 billion. But we have talked about 4, 5, 6, and at the height, $14.6 billion to CETA. This has overwhelmed the staff of the Employment and Training Division of the U.S. Department of Labor.

I notice one of the former directors of the Bureau here. But I asked him several years ago, and again at his retirement, how many times he had even seen the Assistant Secretary. I believe if I am correct, he reported to me he had seen him to talk with him twice since he took office in this administration.

There has not been any time on the part of the hierarchy of the U.S. Department of Labor for this particular interest within that division because they don't see it in the budget and personnel in their Department, because they see billions of dollars for CETA and JTPA, and $15 million, just petty cash money, for apprenticeship.

This is why it is so down played when, in fact, it is worth a complete division within the U.S. Department of Labor because the money is not Federal money for apprenticeship—it is billions of dollars of private money. But that needs coordination to be effective, and that is what is missing.

It is just as important, and, in fact, in my estimation, in the long run it is more critically important to this Nation that it be strongly supported than anything we have ever done in CETA or JTPA and which, as a commissioner of labor of a State, I have an interest in as well also. We are trying to perform and effectively carry out those mandates and those acts.

But in my estimation, neither of them are a shadow of importance compared to apprenticeship.

Mr. GRABOWSKI. We believe that certainly legislative review and overhaul is quite essential in this area. No other method exists for establishing the Federal policy guidance that is needed in this program area.

As Commissioner Brooks pointed out, this is the most cost efficient program from government's point of view, a minimal governmental effort generates millions and billions of dollars of private sector investment. Why? Because the program works.

There are some outstanding examples of that, yet, the program does not seem to filter up. It does not filter up because the promotional and sales effort, the record of success simply has not been delivered to the general public and even to entire industries which could benefit from this.

For example, Mr. Chairman, one of the areas where we are making substantial inroads in the expansion of apprenticeship in New York State is in government employment. Government is a large employer of many apprenticeable occupations. Yet, the concept of government and apprenticeship seems foreign to many people.

It is necessary that we think that through because when you look at it, you find out that it is quite appropriate to use the apprentice training system to develop the skilled workers you need in government and not just the maintenance people, either. For example, we had computer programers and systems analysts that are apprenticeable occupations in New York State, as do a number of other States.

The message needs to get out there and it cannot get out there without that clear signal, that folks mentioned earlier, on the part of the Congress and the U.S. Department of Labor that this is important and we have to do something about it.

Mr. ERLENBORN. It was mentioned that not all States have their own apprenticeship department. What do you think we can do to encourage the rest of the States to take action? Does it require some incentives to be built into the law or merely extort them through the Department of Labor's stepped-up activity?

Mr. GRABOWSKI. Well, extortion has existed since 1937, as Commissioner Brooks has pointed out, and it has worked only partially.

We believe that incentives are appropriate, perhaps on a matching fund basis. It is important to remember, and I think a part of our problem, that we are not talking about big dollars here. If we were talking about $20 billion, we could get everybody's attention. But we are talking about several million dollars, which, on a matching fund basis, would go a long way toward getting each of the States active in the apprenticeship area. The amount is so small that it is hard to get anyone's attention. But we do believe that in some form of incentive is necessary to get the States moving here.

We recognize that there will be some difficulty in balancing that with the States that have historically made a rather substantial investment and might feel disadvantaged if those who had done nothing for years were suddenly rewarded.

So we understand that the technical problems are a little bit difficult but we believe that they are not insurmountable.

Mr. BROOKS. I might add, Mr. Chairman, and I will again elaborate on this, that it was interesting that when this program was first funded in 1937, there was a lot of discussion about the allocation of something like $15,000 for funding the Bureau.

Mr. ERLENBORN. It is worth about the same amount as $15 million. [Laughter.]

Mr. BROOKS. Almost, almost.

But it was succeeded in discussion by an act of Congress that was adopted to allocate $700,000 for a Will Rogers Memorial.

But the point is that at the time, Government programs of this kind were not viewed as being of significant responsibility of the Federal Government. We have seen that changed with the establishment of the—now—instead of Office of Education, the Department of Education, but also with enactment of a lot of public assistance in educational programs like CETA and JTPA, and the kinds of funds that we are putting into that. As a matter of fact, even our State OSHA programs that we have have incentives of either 50 or 90 percent Federal funding, depending on which component a State wishes to pursue—in consultation, 90 percent; and enforcement, 50 percent.

We now have a great deal of experience in providing incentives of this kind by the Federal Government as a part of Federal policy to the States to encourage them.

But this act in 1937 preceded all of that experience. And that is why it is timely now to be addressing it again and looking at it through the eyes of the developing and developed Federal policy and perception of Federal responsibility.

And as an earlier speaker said, when we are looking at the national economy, this has got to be, must be, of a national consequence and perception. And we have a Federal responsibility in addition to the State responsibilities, and it would be both appropriate to appropriate several millions of dollars for matching money in matching the staffs that are financed by the States as well as perhaps considering some incentive programs such as tax incentives for employers who participate in this.

Both of these approaches would be very relevant and appropriate for consideration today. We advocate looking at both of these. And as Mr. Grabowski was just indicating, we are not talking about big money, really, to make a tremendous difference here. In fact, if you put $1 billion in a 10-year period in apprenticeship, you might kill it. As a matter of fact, because it is evolutionary—you can't train the second and third and fourth year until you train the first-year students. You can't just throw a lot of money in it and change it overnight; $50 million to $100 million would make the program fly in ways nobody has imagined. But that is all the kinds of money that we are talking about. We are not talking about half a billion.

I have been very disappointed that with regard to the discussions of the Vocational Education Act renewal that, in fact, there was no discussion to have some set-aside money in that act of that money for apprenticeship. They skirt all around it, but no set-aside money for apprenticeship.

Just $10 million set-aside out of all of that money would make so much difference to apprenticeship.

And, again, another act that is pending before the Congress dealing with the training of needed workers for the Military Establishment, yet another bill, again, no set-aside money. The bill itself talks about the allocation of billions of dollars and yet no money as a set-aside for the actual apprenticeship training.

It talks about training, it allocates money for training, or proposes to allocate money for training. But there is no set-aside money for apprenticeship. And apprenticeship is not all of the training that the bill contemplates, or the same with regard to the Vocational Education Act. It is only a fraction of what that bill encompasses. But without any set-aside money, the experience is, it doesn't get a proportionate amount reflecting the number of trainees in the program—it gets zero dollars. And it will only get zero dollars unless it is called for as a set-aside in those kinds of act.

Mr. GRABOWSKI. As Commissioner Brooks pointed out in that regard, one of our largest tasks in reviewing and analyzing and suggesting recommendations on legislation is to get into the definition section, because everybody walks all around this program and doesn't simply want to put it in the definition section and recognize it as an established and important component of our national employment, training, and manpower policy. And until that happens, every time we work on matters such as this we have to literally fight our way in the door and go through all of the explanations that you and your colleagues have heard here this morning.

Mr. ERLENBORN. I want to thank both of you. You are both articulate spokesmen for the program.

I have a lot of other questions I would like to ask but our full committee is supposed to be meeting this hour, so thank you once again. This concludes the witnesses for today.

Let me also say before I bang the gavel, it is a real pleasure for a member of the minority to be chairman for once. [Laughter.]

Adjourned.

[Whereupon, at 11:35 a.m., the subcommittee was adjourned.]

[Material supplied for the record follows:]

### PREPARED STATEMENT OF JOHN A. GANNON, PRESIDENT, INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS, AFL/CIO CLC

The International Association of Fire Fighters (IAFF), is an affiliate union of the AFL-CIO, representing 170,000 Professional Fire Fighters throughout the United States and Canada, and the oldest public employee union. Our International Union has utilized Apprenticeship Programs since 1975 to train fire fighters to meet National Professional Qualifications and now has more than 16,000 apprentices in training.

This training assures quality fire protection and emergency medical services for a substantial segment of the population. Measured in increased productivity, the reduction of fire loss, and improved care to the sick and injured, the cost effectiveness of Apprenticeship Programs is unexcelled.

In the past, the offices of the Bureau of Apprenticeship and Training, U.S. Department of Labor, have been extremely helpful in assisting us in the formalization of Standards of Training and with the registration of these standards with the applicable State Agency.

The I.A.F.F. wishes to express its concern over the apparent lack of support for the B.A.T. as indicated by staff reductions that in some instances has seriously affected the functional ability of the field offices. I understand, also, that projected plans would still further reduce the staff level in Fiscal Year 1985.

I am sure that any such further reduction in the staff of this agency will cause it to become totally ineffective and consequently will have a severe adverse impact on the Apprenticeship system in the United States.

The Fitzgerald Act, although written in 1937, contains broad enough language to enable it to function in the 80's and beyond as the vehicle to insure the development of highly skilled craftsmen in a cost efficient manner. What the Act needs is support and compliance.

I feel that some of the problems being encountered by the Bureau of Apprenticeship and Training are due to the lack of a dedicated budget. Dependency on a budget based on discretionary funds confers second class citizenship on the recipient. A normal budget process with its associated justifications and hearings would provide the necessary Congressional focus on the Apprenticeship Program.

I am hopeful that this Committee will give due consideration to recommendations that will support the maintaining of the bureau of Apprenticeship and Training at effective staffing levels.

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## STATEMENT OF THE NATIONAL CONSTRUCTORS ASSOCIATION

Mr. Chairman. The National Constructors Association (NCA) is pleased to be permitted to present for the record testimony to the Employment Opportunities Subcommittee on Matters of Apprenticeship Training. We also appreciate the concern the Committee has shown on this matter by conducting these hearings.

The National Constructors Association is made up of 50 of America's largest national constructors who design and build major plants for the electric power generation, oil refining, chemical, petrochemical, paper, mining, and metal fabrication industries.

As a national association working to improve the engineering and construction services of its member companies, NCA is vitally interested in the continued operation of apprenticeship programs, especially as they apply to the construction industry.

NCA members employ building tradesmen for their field construction operations, and it is estimated that in 1982, a slow year for construction, NCA contractors accounted for in excess of 200 million manhours of work on construction projects nationwide.

The apprenticeship training system may not be the total answer to fulfilling the nation's need for skilled workers. Experience has shown, however, that it may be the only successful method to supply skills in construction on an industry-wide basis. It is certainly the most cost effective method of training people to acquire needed job skilles while still performing productive work and getting paid while they learn. Apprenticeship training in the construction industry as we have known it has turned out well-rounded productive workers who are skilled in the multi-faceted requirements of qualified building tradesmen. This is accomplished through the comprehensive blending of on-the-job training with the required course of study that each apprentice has to master before graduation to journeyman status. It should be noted here that a majority of today's apprenticeship programs have mandatory requirements of a specified amount of time (hours) devoted to on-the-job training and accomplishing all of the study requirements before any consideration can be given to joining the journeyman rank. The flexibility of many apprenticeship programs in the construction industry is shown in the innovative feature of allowing credits for proven experience gained by the individual apprentice prior to his of her indenture into a program.

For the unionized sector of the construction industry, the apprenticeship programs are a unique success story of joint labor-management cooperation. Programs are sponsored by joint apprenticeship committees where labor and management share in the duties and responsibilities of program administration. Revenue to fund joint apprenticeship programs is determined through the collective bargaining process where contribution rates are agreed to by the appropriate negotiating committees who have recognized the need for continued support of effective programs that will meet the needs of the industry.

It is NCA's position that the national apprenticeship program not only remain as presently established, but some effort be made to strengthen the role of the Bureau of Apprenticeship and Training in setting national standards for regulating and administering apprenticeship plans.

The construction industry is such a diverse industry with so many elements that the federal government is the only entity that can set realistic guidelines for administering apprenticeship programs that will serve the construction industry as a whole. Many apprenticeship programs are regional or national in scope and having met national standards and certification requirements, can devote their time and energy to meeting the skill training needs of the industry. Any move to decentralize the functions of the Bureau of Apprenticeship and Training to the individual states would be chaotic and counter-productive. The amount of time and cost involved in certifying apprenticeship programs to meet each and every state's criteria would put a serious burden on many programs and take away the resources now being used to promote sound programs to meet the industry needs for trained and skilled tradesmen.

Although the construction industry has been severely depressed in the last few years, it is also true that the Department of Labor has forecasted that over 2 million new construction craftsmen will be needed by 1990. Best estimates show that less than 50,000 craftsmen are being turned out each year by existing training programs and at this rate, the projected needs for the 1990's will not be met. All the more reason to support and seek to expand and promote apprenticeship programs.

It is a generally accepted fact that American industry in general has been suffering from a decline in productivity that is seriously affecting its long standing stature in providing goods and services here and around the world. The construction sector has much to do to improve its own productivity and one of the many ways to accomplish positive productivity gains is to give full support to the many established apprenticeship and training programs that are geared to provide the industry with skilled craftsmen.

There is a great deal of discussion these days of not only improving existing training programs, but utilizing the existing structures and making good use of apprenticeship training experience to extend training efforts in the areas of foremen training, supervisory training, and journeyman upgrading. These efforts should be promoted by all segments of the industry as a continuing effort to meet those needs we will all face in the not too distant future.

Recent studies have shown that for many reasons there is a desperate need for the construction industry to greatly improve its ability to develop skills and training methods that will help this country return to a vibrant economy.

In conclusion, the NCA submits that the presently established apprenticeship and training functions be given the appropriate support and resources to actively promote programs that will enhance the ability to provide greater employment opportunities for all people and to explore innovative methods of training that will begin to meet the needs of tomorrow. It is also the opinion of the NCA that any consideration toward decentralization of the apprenticeship training function would constitute a gaint step backward and would not serve to benefit any sector of the industry.

A great deal of money and time have been expended to bring the apprenticeship training programs where they are today and our efforts must be to preserve and improve on-going programs that have shown a willingness to provide a critical industry with properly trained and motivated tradesmen.

The National Constructors Association wishes to offer any other assistance the Committee would deem appropriate.

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HOME BUILDERS INSTITUTE,
*Washington, D.C., November 29, 1983.*

Hon. GUS HAWKINS,
*Chairman, House Subcommittee on Employment Opportunities, Rayburn House Office Building, Washington, D.C.*

DEAR CONGRESSMAN HAWKINS: On behalf of the Home Builders Institute (HBI), the National Association of Home Builders, I am pleased to submit our views on apprenticeship. Our association commends you for lending your respected leadership and attention to this very critical issue.

The apprenticeship system of the United States is in very serious trouble. We need the help of those persons in Washington most able to help the situation.

There are presently only 300,000 apprentices registered in the United States. Germany registers more than 1,300,000. There is little doubt in my mind that this low level of utilization of the apprenticeship system is a major contributor to the continuing employment problems our nation faces.

A recent document prepared by the Acting Administrator of the United States Department of Labor, Bureau of Apprenticeship and Training, stated that for every dollar spent in administering the apprenticeship system, the government receives a return of $17.00 in taxes from each apprentice enrolled. No other training program that I know of returns such a handsome investment. The apprenticeship system is not only time honored, it is cost effective.

My comments will be directed to specific issues of importance to the home building industry, the sixth largest employer in the country. I can tell you there are insufficient apprenticeship programs to serve our industry. Almost lost because of the home building industry's concern over high interest rates is the undeniable fact that builders are facing a serious shortage of skilled labor. The situation is camouflaged for the moment because of slack production. But when the economy completes its turn-around, builders must supply shelter for the 2.1 million new household formations of the 1980's. As the true demand for housing returns, we will be unable to produce housing fast enough and our labor problems will be acute. With apprenticeship . . . a systematic approach to learning by doing . . . a young person can be productive during the entire period of training.

Before I make specific recommondations to improve and strengthen the apprenticeship system, let me share a few pertinent statistics about our industry's apprenticeship programs. This year approximately 2,500 youth and adults enrolled in HBI apprenticeship programs in seven construction trades. Women represented 6.5 percent of the total enrollment in pre-apprenticeship programs; minorities represented 32 percent.

In the Northeast Florida Builders Association, of which I am a member, our current enrollment of 350 apprentices in the five trades of carpentry, electrical, heating and air conditioning, plumbing and sheet metal, has a good mix of minorities, but less success with female representation. Although we participate in high school career days, attend workshops for women in apprenticeship and advertise for women applicants, of the 600 construction applicants for our apprenticeship programs this year, only 6 were females. Two were qualified for selection. We do point with pride, however, to the fact that our Vice President for Training is a woman, as is our Training Director. Our placement and job retention rate is an impressive 98 percent.

The specific recommendations I would like to offer to the Subcommittee on behalf of the NAHB Home Builders Institute are as follows:

1. Federal legislation spearhead the development of standardized competencies in each trade to improve both education and apprenticeship programs.

Although the apprenticeship system is largely privately financed, it is in the national interest to maximize employment opportunities for all citizens. If the federal government stimulated the development of standardized competencies in each trade, individuals would be assured of training that is industry approved and transferable across state lines. These standardized competencies would be the basis for integrating vocational education and apprenticeship programs.

2. Federal legislation should not require apprenticeship programs to be registered through the the Federal Bureau of Apprenticeship and Training or a similar state agency.

Apprenticeship predates by centuries any thought of public manpower policies and remains the preserve of private employers. Thus, industry experts in collaboration with educators and community leaders, should have the prerogative of registering apprenticeship programs. The federal government should be concerned only with the related issues of access, equity, and the protection of apprentices to assure that training takes priority over production.

3. Federal legislation should encourage flexibility in determining the ratio of apprentices to journeymen.

Historically, apprenticeship has been structured on a one to one basis. Regulations, like those in Florida for the electrical industry, now require a ratio of one apprentice to three journeymen. With the millions of young people needing employment skills, it is indeed a shame that this arbitrary rule denies opportunity for training to young people.

4. Federal legislation, and its accompanying regulations, should allow apprenticeship programs to be structured on the basis of competencies learned.

Achievement, not time, should be the measure of an individual's attainment of journeyman status. Competency-based instruction, which incorporates written and performance tests, is a very successful teaching method. Neither the federal or state government should ever be in the position of dictating specific teaching methodologies.

5. Federal legislation should encourage innovative efforts to link vocational education and apprenticeship programs.

Better articulation is needed between education institutions and employers to enhance a young person's acquisition of basic skills (reading, writing, math) and occupational skills. Collaborative efforts can help improve the employment status of vocational education graduates and can help employers obtain individuals who are better prepared for an apprenticeship program.

In sum, with respect to our country's pressing need to train young people and adults for productive employment, it is time to promote a sensible and open policy on apprenticeship. I urge you, Congressman Hawkins, to put forth every effort to stop the apprenticeship system from atrophying. The Home Builders Institute, the educational arm of NAHB, stands ready to assist you in this important effort.

Sincerely,

CARMEL MORRIS, *Vice President,*
*Allstate Electrical Contractors, Inc.*

[Western Union Mailgram]

INDEPENDENT BUSINESS ASSOCIATION
*Bellevue, Wash., November 30, 1983.*

Re testimony for oversight of national apprenticeship program.

Hon. AUGUSTUS F. HAWKINS,
*Chairman, Subcommittee on Employment Opportunities, House Committee on Education and Labor, Washington, D.C.*

DEAR CHAIRMAN HAWKINS AND MEMBERS OF THE COMMITTEE: On behalf of thousands of small business owners, Independent Business Association of Washington State wishes to express the concerns and views of small businesses regarding our Nation's apprenticeship program. Unfortunately, we must report that often, apprenticeship programs are being used in Washington State to limit competition between firms and to restrict work experience for trainees on Federal projects. IBA's following comments will support these statements.

Independent Business Association has been working with several of the specialty trades in the construction industry in an effort to register apprenticeship programs with Washington's joint apprenticeship and training council. Every such effort has been met with strong opposition and has resulted in failure.

The inability for specialty trades to register a parallel apprenticeship programs in Washington State is primarily to limit competition. This is done through the use of the Federal and State Davis-Bacon Acts which require prevailing wages to be paid on Federal and State public construction projects. All workers, except apprentices in approved apprenticeship programs, must be paid 100 percent of the established prevailing wage rate. Apprentices enrolled in approved apprenticeship programs can be paid as little as 45 percent of the established prevailing wage rate. Apprentices not enrolled in approved programs must be paid 100 percent of the established prevailing wage rate. With apprentices often making up 25 percent to 33 percent of the work force on such public construction projects, firms with approved apprenticeship programs have a clear and sizeable competitive advantage over those employers do not have approve apprenticeship programs.

In an internal review done in Washington's Attorney General's office and dated May 28, 1981, the following comments were made:

"The section in controversy was not added until 1980. There is no clear indication concerning its purpose or applicability. The current regulation can be criticized in many respects:

"1. It expands the wage-setting powers of the Department of Labor in areas never considered under the Davis-Bacon Acts.

"2. It mandates wage scales absent collective bargaining.

"3. It requires new programs to set wages at existing scales, thus eliminating wage competitions.

"4. The scheme regulates substantive provision of contract, which has never previously been the purpose of the apprenticeship council. The council was formed to create education standards, not set actual wages.

### "CONCLUSION

"There is no clear reason why this regulation is necessary. It appears to be an anti-trust violation and beyond the council's powers. Repeal would be appropriate, absent some express policy by the legislature."

Yet, the rules still remain in force in Washington State. Thousands of apprenticeship opportunities go unfilled. Federal and State public construction projects are not available for work experience to apprentices whose employers are unable to get approval of an appropriate apprenticeship program. The committee should understand that if Washington were a BAT State, such programs would have been registered many years ago for the benefit of Washington's workers as these programs meet all of the Federal apprenticeship criteria.

The State rule that has been adopted requires that any apprenticeship program established in an area already served by an apprenticeship program in the same trade or craft, that the new program must have the same wages as the existing program, or the prevailing wage rate as established by either the State or Federal Davis-Bacon Acts. Essentially, these wages are the union wages and non-union contractors are then forced to pay union wages which they were unable to negotiate themselves in the collective bargaining to set those wages. This violates Federal laws which prohibit enforcement of contracts where all parties to the contract were not allowed to negotiate the terms of said contract.

### RECOMMENDATIONS

1. IBA strongly encourages the committee to continue the Federal apprenticeship statutes to avoid anti-competitive and non-educational manipulation of apprenticeship programs to restrict competition or facilitate some special interest group or groups.

2. IBA strongly supports the continued existence of the Federal Bureau of Apprenticeship and Training. This is the only Federal agency in a position to try and stop abuse of the Federal apprenticeship laws as is the experience here in Washington State.

3. IBA strongly encourages the committee to consider legislation strengthening the Federal Bureau of Apprenticeship and Training to enable them to approve programs in SAC States where the State established unreasonable requirements for approving apprenticeship programs.

4. IBA strongly encourages the committee to review and consider repeal of the Federal provisons which prohibit recognition of BAT approved apprenticeship programs in SAC States for construction industry programs.

Independent Business Association stands ready to assist the committee in any way to insure the maximum number of apprenticeship training opportunities exist for workers and employers and that our national apprenticeship programs are carried out as intended and not abused to benefit limited special interests.

GARY L. SMITH,
*Executive Director.*

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## STATEMENT OF THE AMERICAN SOCIETY FOR TRAINING & DEVELOPMENT

On behalf of the members of the American Society for Training and Development, we should like to submit this testimony for the record of the Oversight Hearing on the National Apprenticeship Act.

Our Society represents the largest group of professionals engaged in human resource development in the world of work in the U.S. The field we represent is the largest and most effective force in the training and retraining of the American work force and is also in the forefront of the state-of-the-art of job training practices.

Prior to the Hearings, we expressly solicited comments from our members about the federal role in apprenticeship through our newsletter and directly from our ASTD National Issues Committee and the ASTD Technical Skills Training Division.

Several of the witnesses at the Hearing were provided through our Society.

The comments here are intended to represent a synthesis of the comments and reactions we have had form our members.

1. The comment we have had most consistently from our members is that apprenticeship programs should be based on demonstration of competencies rather than on time spent in the program. Professionalism in our field is invariably associated directly with job and career performance improvement and productivity improvement. The universal objective is to provide the learner the needed job knowledge and skills by the most efficient means. Economic forces, both domestic and international, argue inexorably that efficient development of the work force is essential for the economic well being of both the individual citizen and the nation.

We have an extensive body of knowledge about how to determine training needs for job performance, how to provide job training that will achieve that job performance and how to assess success in determining that achievement. The underlying premise is the competency-based approach. Our Society stands ready to bring the state-of-the art in job training to areas of need in apprenticeship. We should note that many apprenticeship programs are now competency-based already, although, unfortunately, most of these are not in the federal apprenticeship system.

2. We would suggest, as Dr. Lyons did at the Hearing, that appropriate Department of Labor personnel and others who administer federal apprenticeship programs receive education and training in modern job training practices. Job training has changed dramatically over the past decade or so and is still changing especially with regard to new information and communications technologies.

3. The whole federal apprenticeship system must be able to deal with change. The evidence is overwhelming and obvious that jobs change and that what workers need to know and be able to do to be successful changes continually, sometimes at quickening paces. There must be close ties to actual workplace needs.

4. The Congress should make every effort to encourage investment in the nation's human capital through worker education and training. The federal government should provide incentives and remove disincentives to this end. Those being trained,

such as apprentices, should not be required to pay income tax on employer-provided educational assistance that improves their earning and tax paying potential. The federal government should not discourage employers from investing in their employees' development of their potential by legislating extensive or unnecessary regulatory and reporting requirements. The quality of the work force will be the most critical factor in the nation's economic future.

We should be most pleased to aid and support the Congress in any way we can in building America's work force.

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NOVEMBER 3, 1983.

Mr. R. H. WEBB, Jr.,
*Chairman, Virginia Apprenticeship Council,*
*Richmond, Va.*

DEAR MR. WEBB: Thank you for your correspondence with respect to apprenticeship programs.

The Subcommittee on Employment Opportunities, chaired by Representative Augustus Hawkins, will be holding oversight hearings on the Nation's apprenticeship programs on November 15 and 17. I have referred your correspondence to that Subcommittee, to be included in the record in connection with these hearings.

I appreciate your sharing your views with me.

Sincerely,

CARL D. PERKINS, *Chairman.*

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RICHMOND, VA., *October 17, 1983.*

Hon. CARL D. PERKINS,
*Chairman, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR SIR: I am writing to support the holding of hearings this fall on the Federal Apprenticeship Program. I am Chairman of the Virginia Apprenticeship Council; however, since this matter has not been discussed with the Council, my remarks should be taken as personal. Apprenticeship training is vital to the manpower needs of our nation. This is particularly true at this time with the shift in worker requirements towards more technical work—yet with the need for apprenticeship increasing, there is little direction or impetus from the government.

There are several concerns that should be addressed by these hearings. First, the role of the government in apprenticeship training needs better definition. This role is very simple from my viewpoint. It should be to encourage and promote apprenticeship training particularly in areas where there are manpower shortages. An important part of this activity is to assist employers in establishing training programs where help is needed. Second, I believe that the unnecessary and expensive overlap of federal and state agencies in the states should be eliminated. In my view, the individual states should be given the responsibility for their apprenticeship programs. They can do the job more effectively and at less cost than the federal bureau. There, of course, will still be a need for a federal agency to coordinate activities of the states and to gather and analyze statistics at the national level.

Very truly yours,

R. H. WEBB, Jr.,
*Chairman, Virginia Apprenticeship Council.*

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NOVEMBER 3, 1983.

Mr. FRANK B. SMITH,
*Labor Commissioner, Labor and Industrial Commission,*
*Santa Fe, N. Mex.*

DEAR MR. SMITH:, Thank you for your correspondence with respect to apprenticeship programs.

The Subcommittee on Employment Opportunities, chaired by Representative Augustus Hawkins, will be holding oversight hearings on the Nation's apprenticeship programs on November 15 and 17. I have referred your correspondence to that Subcommittee, to be included in the record in connection with these hearings.

I appreciate your sharing your views with me.

Sincerely,

CARL D. PERKINS, *Chairman.*

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NEW MEXICO LABOR AND INDUSTRIAL COMMISSION,
*Santa Fe, N. Mex., October 18, 1983.*

Hon. CARL D. PERKINS,
*Chairman, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR CONGRESSMAN PERKINS: It is my understanding that the oversight hearings on the Federal Apprenticeship Program are now scheduled to be held on November 9th and 10th.

I have also heard that there is a possibility that strong opposition to hold the oversight hearings may develop. This possibility, if it is in fact a possibility, greatly disturbs me. I feel that apprenticeship is the most effective and cost-efficient method of training ever devised, and needs the support of concerned members of Congressmen such as yourself to help assure that it is given more support at the national level. It is may hope that the oversight hearings will be held as I feel confident that testimony which will be given during these hearings will be of great assistance in reversing the present trend toward placing less importance on this training system.

I firmly believe if this trend is allowed to continue, the consumers in this nation, as well as the workers who produce our goods and services, will suffer as a result if a more poor quality of goods and services caused by workers who are not nearly so well trained as they would have been had they completed a good apprenticeship program.

I respectfully request that you use your influence in every way to cause these oversight hearings to be held.

Very truly yours,

FRANK B. SMITH,
*Labor Commissioner.*

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NOVEMBER 3, 1983.

Mr. JOSHUA C. AGSALUD,
*Director, Labor and Industrial Relations, State of Hawaii, Department of Labor and Industrial Relations, Honolulu, Hawaii*

DEAR MR. AGSALUD: Thank you for your correspondence with respect to apprenticeship programs.

The Subcommittee on Employment Opportunities, chaired by Representative Augustus Hawkins, will be holding oversight hearings on the Nation's apprenticeship programs on November 15 and 17. I have referred your correspondence to that Subcommittee, to be included in the record in connection with these hearings.

I appreciate your sharing your views with me.

Sincerely,

CARL D. PERKINS, *Chairman.*

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STATE OF HAWAII,
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS,
*Honolulu, Hawaii, October 20, 1983.*

Hon. CARL D. PERKINS,
*Chairman, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR CONGRESSMAN PERKINS: In response to NAP President John Brooks' letter to me dated October 10, 1983 (copy sent to you), I am sending you a copy of my answer to Mr. Thomas F. Royals (liaison officer for Congressman Erlenborn).

Sincerely,

JOSHUA C. AGSALUD,
*Director of Labor and Industrial Relations.*

Enclosures.

NATIONAL APPRENTICESHIP PROGRAM,
*October 10, 1983.*

Hon. JOSHUA C. AGSALUD,
*Director, Department of Labor and Industrial Relations,*
*Honolulu, Hawaii.*

DEAR DIRECTOR AGSALUD: In recent months there has been discussion about the need for oversight hearings on the federal apprenticeship program and activities. As a result of the interest expressed by Congressman John N. Erlenborn, Republican Representative for the 13th District of Illinois, the ranking minority member of the Committee on Education and Labor, U.S. House of Representatives, such oversight hearings have now been scheduled for November 9 and 10 in Washington, D.C.

Tom Royals of Congressman Erlenborn's staff has speculated that the subcommittee might decide to recommend some major change in the administrative authority over the Bureau of Apprenticeship and Training and that perhaps it should be placed under an independent commission separate from the U.S. Department of Labor and Education.

The National Apprenticeship Program, the joint organization representing NAGLO and the National Association of State and Territorial Apprenticeship Directors (NASTAD), met recently in Washington, D.C., with Tom Hague, the designated new director for the federal Bureau of Apprenticeship and Training. Tom Hague suggested that the Secretary of Labor and subordinate staff may be opposed to any hearing being held which might give rise to such a proposal. Nevertheless, there is a great need for an overall reassessment of the current predicament of the federal apprenticeship program. The National Apprenticeship Program is of the view that the federal apprenticeship program is going nowhere fast and is probably atrophying at a considerable rate of speed.

Apprenticeship very much needs support from all across America, and we believe that America needs to support apprenticeship. Congressional hearings are essential if there is to be a major shift in policy within the federal government on apprenticeship. Hearings should be held and I would ask that you write Congressman John N. Erlenborn, Congressman Augustus F. Hawkins, Chairman of the Subcommittee on Employment Opportunities, as well as Congressman Carl D. Perkins, Chairman of the House Committee on Education and Labor, supporting the holding of hearings this fall on the federal apprenticeship program. You may also want to submit additional substantive comments to both Congressman Erlenborn and Congressman Hawkins.

Thank you for your cooperation in this important endeavor.

Sincerely yours,

JOHN C. BROOKS,
*President, NAP, Inc.*

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STATE OF HAWAII,
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS,
*Honolulu, Hawaii, September 15, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education & Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: Thank you for your letter of August 29, informing me of the planned hearings on the National Apprenticeship Program and for the opportunity to offer a few comments regarding the apprenticeship programs.

I'm sure that the hearings will bring forth the current status on apprenticeship and hopefully provide some positive support.

We have a state apprenticeship agency, and the administrator, Mr. Stanley Honda, is a member of the National Association of State and Territorial Apprenticeship Directors (NASTAD). We support any positive help toward a better apprenticeship.

Nationally, the apprenticeship program over the last several years has been steadily declining in many areas, noticeably in the total number of registered apprentices and registered programs.

A large portion of this decline is attributed to the downturn of the economy. The inability of employers to hire, due to economic reasons, obviously hampers the overall apprenticeship community because apprentice programs depend on employment and employment opportunities.

There has been national emphasis on other programs to help ease the high rate of unemployment, programs such as the Comprehensive Employment and Training

Act (CETA) and the new Jobs Training Partnership Act (JTPA), jobs for veterans program, and other funding to help specific interest groups.

Yet, there has been very little help to rescue apprenticeship. Apprenticeship training has been for centuries the proven and preferred method of training. Nationally, there has been little support. The Federal Committee on Apprenticeship has been inactive for some time, and the Federal Bureau of Apprenticeship has been trying to survive with their limited budget.

The apprenticeship program throughout this country needs direction and leadership, especially during these times. The future of apprenticeship in part, requires the strong support from the Federal government.

Sincerely,

JOSHUA C. AGSALUD,
*Director of Labor and Industrial Relations.*

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COMMITTEE ON EDUCATION AND LABOR,
HOUSE OF REPRESENTATIVES,
*Washington, D.C., August 29, 1983.*

Hon. JOSHUA C. AGSALUD,
*Director, Department of Labor and Industrial Relations,*
*Honolulu, Hawaii.*

DEAR MR. AGSALUD: The Committee on Education and Labor is planning to conduct hearings on the National Apprenticeship Program this autumn. The hearings will focus on the role and functions of business and industry, the labor unions, the educational community, various training, industrial and construction associations in the national program. A review of the operations of the Federal and State governments will also be part of these hearings.

The Committee has a strong interest in seeing the apprenticeship program strengthened as a means of supplying skilled training to meet our economy's changing employment requirements.

Your written comments on the status of the apprenticeship program, its operation today, and the future of apprenticeship would be most welcome.

If I can be of any assistance in this matter, please call me at (202) 226-3110.

Sincerely,

THOMAS F. ROYALS,
*Liaison Officer.*

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STATE OF FLORIDA,
DEPARTMENT OF LABOR AND EMPLOYMENT SECURITY,
OFFICE OF THE SECRETARY,
*Tallahassee, Fla., October 24, 1983.*

Hon. CARL D. PERKINS,
*Chairman, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR CONGRESSMAN PERKINS: Having been directly involved in Florida as the Secretary of the Department of Labor and Employment Security, and as a participant in the NAGLO, NAP, and NASTAD meetings, I am convinced that one of the major factors contributing to the problems now facing America's industry is the degeneration of the National Apprenticeship Program of this Nation.

It is vital to us, as a people, to ensure that the highly skilled work force of this nation does not disappear, that we preserve and expand it. In order to accomplish this, a serious look must be taken at the Federal Bureau of Apprenticeship and Training and the individual State Apprenticeship Bureaus.

The Federal Bureau of Apprenticeship and Training has reached a low ebb, and it is imperative that the Bureau be reassessed. There is no question in my mind of the need for the services of the Bureau to the states and the apprenticeship community. However, it is impossible for that agency to accomplish the mission given it by the Fitzgerald Act, if it is not funded or staffed properly. The Bureau is now located in, and should remain in, the Department of Labor. This is necessary, due to the fact that wages, hours, and working conditions are the responsibilities of the Departent of Labor. Subsequently, the Bureau of Apprencticeship and Training is responsible for the welfare of the apprentices, i.e. wage scales, hours and working conditions.

The Bureau of Apprenticeship and Training and the Florida Bureau of Apprenticeship have an excellent relationship and we have accomplished much. However, there are many opportunities for apprenticeship being lost due to lack of personnel, funds, and promotional material. These should be considered and serious consideration should be given to supplemental funding for the states which now have apprenticeship bureaus. I know there are many concerns and problems facing the apprenticeship program, but we must take first things first and start with rebuilding a firm foundation from Washington.

I am sincerely interested in seeing the National Programs become revitalized, viable and operating as it should, and believe the hearings should be held this fall on the National Apprenticeship Program.

Anything you can do to help will be appreciated.

Cordially yours,

**Wallace E. Orr**, *Secretary.*

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November 3, 1983.

Mr. **Elmer J. Steier**, Jr.,
*Supervisor, Apprenticeship and Training,*
*Department of Labor, Frankfort, Ky.*

Dear Mr. Steier: Thank you for your correspondence with respect to apprenticeship programs.

The Subcommittee on Employment Opportunities, chaired by Representative Augustus Hawkins, will be holding oversight hearings on the Nation's apprenticeship programs on November 15 and 17. I have referred your correspondence to that Subcommittee, to be included in the record in connection with these hearings.

I appreciate your sharing your views with me.

Sincerely,

**Carl D. Perkins**, *Chairman.*

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Department of Labor,
*Louisville, Ky., October 18, 1983.*

Hon. **Carl D. Perkins**,
*House of Representatives,*
*Washington, D.C.*

Dear Sir: The Kentucky State Apprenticeship and Training Council, composed of labor and management representatives, has met and given full endorsement to the recommendations for strengthening the National Apprenticeship System as stated in Commissioner of Labor, Thelma L. Stovall's letter of October 3, 1983 to the Congressional Committee on Education and Labor, which is attached.

The State Council urges your support for these recommendations and formulation of legislation which makes a commitment to our nation's National Apprenticeship Program and assures coordination with each cooperating state in a concerted effort to achieve the expansion of our most time proven, cost effective skills training method that we have, in order to meet the changing needs of all our nation's industries.

The Congressional Hearings scheduled to hear these recommendations are scheduled for November 9 and 10, 1983 in Washington, D.C. at 9:00 a.m. in the Rayburn Building. Your support in this matter would be most appreciated.

Thanking you in advance, on behalf of the Kentucky State Apprenticeship and Training Council, for your support. I remain

Sincerely,

**Elmer J. Steier**, Jr.,
*Supervisor, Apprenticeship and Training.*

Enclosure.

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Commonwealth of Kentucky,
Department of Labor,
*Frankfort, Ky., October 3, 1983.*

Mr. **Thomas F. Royals**,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: We most certainly support the Congressional Committee on Education and Labor's interest in strengthening the National Apprenticeship Program. I recommend that a good start toward achieving this goal would be through a strong commitment and legislation by Congress to provide federal matching funds to states as an incentive to support the federal commitment. Follow this up with National Apprenticeship policies formulated and implemented by the U.S. Department of Labor as a priority under the direction of Congress to meet this commitment. Without this total commitment at the federal level, individual state apprenticeship agencies and programs are facing dissolution as a very real possibility resulting from state budget cuts with more in the offing.

In response to employer complaints about their training apprentices to maintain desirable journeymen levels in their industry while many employers refuse to train, I recommend that federal tax incentives be provided to Sponsors of registered apprenticeship training programs based on the number of registered apprentices trained and completed. In my opinion, this would assure a more continuous flow of registered apprentices and alleviate to a degree the occurrence of cyclical skill shortages occurring periodically due to economic downturns and the subsequent loss of continuity of training in many apprenticeship training programs.

In order to ensure a partnership concept and a coordinated working relationship between the Bureau of Apprenticeship and Training and State Apprenticeship agencies, I recommend a clarification of their respective roles and participation of federal policy makers with B.A.T. and State Labor Department representatives in discussions of National apprenticeship administrative policies and delineation of areas of responsibility. There is a need for a central Apprenticeship and Training agency at the federal level which provides oversight and technical support to state apprenticeship agencies. It is my opinion that without this central support agency, the nation's apprenticeship program will become fragmented and the degree of effectiveness of each state's apprenticeship program would be impacted adversely by its removal.

The national apprenticeship program of today has lost its thrust as a result of being assigned a low level priority in the U.S. Department of Labor, Employment and Training Administration. This becomes evident when you consider the abolishment of the State and National Apprenticeship Reporting System which provided each state apprenticeship agency with vital national, regional and individual state apprenticeship data from throughout the nation. This data reflected the broad involvement of the private sector in registered apprenticeship training in individual industries and occupations and served as a tool for evaluating progress of affirmative action in recruitment and registration of minority and female apprentices. I recommend national policy which recognizes the effectiveness of the National Apprenticeship Program in the private sector and sees to the publicizing of this recognition. At the present we have the strange situation existing where the most successful and effective private sector supported skills training which is embodied within the National Apprenticeship Program, receives little or no public recognition. When you consider this type of national approach and low priority apprenticeship policies, there is no mystery as to why we need an infusion of national commitment into our nation's apprenticeship training program. In my opinion, if this federal commitment is not forthcoming in the immediate future the apprenticeship training system and our national program is going to languish on the vine.

Activation of the dormant Federal Committee on Apprenticeship at this juncture is vital to the National Apprenticeship Program and its future. Close communication between the Committee and the U.S. Secretary of Labor concerning apprenticeship training recommendations by the Committee, is sorely needed. I recommend that representation on the Federal Committee on Apprenticeship be broadened in order to provide for more input from states.

Looking to the future and addressing the shifting skills training needs of private industry relative to technological advances in any industry, should be the responsibility of our National Apprenticeship Training Program with close cooperation and support to states in accomplishing this task. It is already the most time proven adaptable method for training persons in skills which will provide the individual with long term employment opportunities and the versatility to advance themselves up a career ladder. With this concept in mind, I recommend close Congressional attention to recommendation for investment and commitment in our National Apprenticeship Program and consideration of the economic benefits realized by our Nation as a direct result of utilizing this program as the best training system for equipping persons to meet the labor market demands of today and in the future.

Sincerely,

THELMA L. STOVALL,
*Commissioner of Labor,*
*Kentucky Department of Labor.*

STATE OF NEW YORK,
DEPARTMENT OF LABOR,
*Albany, N.Y., September 13, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, House Committee on Education and Labor, Rayburn Office Building, Washington, D.C.*

DEAR MR. ROYALS: I appreciated receiving your August 29 letter advising me that the Committee on Education and Labor will conduct hearings on apprenticeship this Autumn. When I learned earlier that the Committee was considering such action, I wrote to Congressman Hawkins expressing my support and willingness to testify. A copy of my earlier letter is enclosed.

I share the Committee's desire to see the Nation's apprenticeship program stengthened. Apprentice Training is the most cost-efficient way to produce the skilled workers our Nation needs. It is the private sector's preferred system of training, as evidenced by the thousands of firms and Joint Apprenticeship Committees which regularly invest millions of their dollars in their programs. Nearly 300,065 apprentices are in training today, but the total national effort is insufficient to relieve potential shortages in some skilled occupations.

Government, too, invests in apprenticeship through the allocation of resources for staff, promotion, supervision and credentialing. The return on this investment is substantial; the small amounts expended are quickly returned through the increased productivity of the work force plus enhanced earnings and purchasing power for the apprentices.

However, despite the obvious benefits of apprenticeship and its proven quality and cost-effectiveness, the program is largely unrecognized, underfunded, and fragmented in its administration. The upcoming hearings provide an opportunity to begin correcting these weaknesses.

As a first step, the Congress should publicly recognize the contribution which apprenticeship has made, and continues to make, to our Nation's skilled worker resources. The Committee on Education and Labor is to be commended for its awareness of apprenticeship's important role and the need to strengthen it. That awareness must become an accepted fact throughout the Nation, and reflected in programmatic changes.

Federal and State statutes on apprenticeship have remained unchanged for many years. Roles and responsibilities have become blurred, operating procedures between State and Federal agencies often overlap, and the level of effort from State to State is very uneven. Thus it is essential that the Congress and the Executive Department adopt and promulgate a clear, concise national policy on apprentice training. This policy should emphasize the importance of apprenticeship and set forth its priority among employment and training programs. Furthermore, the statement should spell out appropriate roles for Federal and State Governments, to insure that scarce Federal resources are not used to perform functions which are best delivered at the State level, such as registration, supervision, and the credentialing of experience. Federal efforts can be most effective when directed toward promotion, national and State coordination, and the provision of technical assistance to the States.

Most States have accepted their apprenticeship responsibilities under their own State laws, regulations and appropriations, but some have not. Federal policy and incentives should be developed to insure that all States accept their obligations and allocate sufficient resources to fulfill them. Those States which are meeting their obligations now must be encouraged to expand their efforts, while States which have not accepted responsibility must be prompted to get started.

The Job Training Partnership Act can be an important part of a Federal/State effort to expand apprenticeship. Private sector employer and union representatives on PICs are familiar with the system, and will evidence strong support for expanding and linking it with ongoing and developing employment and training efforts. All levels of government should encourage and assist such private sector efforts. Federal technical assistance describing how this is best done within the statutory framwork would be a valuable contribution to the total effort.

Beyond these basic considerations there is an urgent need for a current, reliable national apprenticeship data system. Federal, State and SDA officials need to know the number, kind, and quality of apprenticeship existing in their areas to avoid duplication of effort, insure program linkages and provide for an adequate supply of skilled workers. Without this information, accurate planning is impossible.

National promotion efforts and technical assistance to the States also are needed to strengthen the apprenticeship system. Building a working, productive Federal/State partnership requires both a small initial investment and clarity of purpose.

The rewards and returns will be substantial, satisfying and reflected quickly in the Nation's competitive posture.

I hope to have the opportunity to expand upon these comments at the Hearings.

Sincerely,

LILLIAN ROBERTS,
*Commissioner of Labor.*

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[Memorandum]

U.S. DEPARTMENT OF LABOR,
EMPLOYMENT AND TRAINING ADMINISTRATION,
*Washington, D.C., August 6, 1982.*

To: Members of the Federal Committee on Apprenticeship and Others Interested in Apprenticeship.

From: Bob Glover, Chairperson.

The Department of Labor's neglect of apprenticeship and the Federal Committee on Apprenticeship has reached such a high level that I feel it ludicrous to continue to serve as chairperson of the Committee. Attached you will find a copy of my letter of resignation to Secretary Donovan.

It is with sadness that I am taking this action, not only because I see so much unrealized potential in the FCA but also because I have treasured working with so many dedicated individuals on the Committee and in the apprenticeship community. I shall greatly miss you.

Having served as chairperson of the Federal Committee on Apprenticeship for the past four years, I am convinced that it is essential to have a stronger national focus for apprenticeship representing the interests of apprentices, workers and employers and the public across all apprenticable trades. Stronger national leadership is in the interest of apprenticeship both at the state and local level as well as the federal level. Further such a national coalition cannot be as dependent on the Department of Labor as the FCA now is. Is it feasible to have a Federal Committee on Apprenticeship independently organized and privately financed and staffed? If so, how? Can such a national apprenticeship coalition be built and maintained without total Labor Department sponsorship? These questions merit serious consideration from the apprenticeship community.

I plan to continue writing and researching apprenticeship issues (I think apprenticeship is in my blood!) I hope many of our paths will cross again in the future.

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U.S. DEPARTMENT OF LABOR,
EMPLOYMENT AND TRAINING ADMINISTRATION,
*Washington, D.C. August 6, 1982.*

Hon. RAYMOND J. DONOVAN,
*Secretary of Labor, U.S. Department of Labor,*
*Washington, D.C.*

DEAR SECRETARY DONOVAN: I am writing you to resign from my position as Chairperson of the Federal Committee on Apprenticeship. I am taking this action to protest the abysmal record of your administration regarding apprenticeship training.

Due to disinterest, inactivity and neglect on the part of your administration, the Federal Committee on Apprenticeship has become no more than a facade and I can no longer tolerate the frustration of serving as chairperson. For more than six months from September 1981 to April 1982, almost half of the memberships on the committee remained vacant awaiting your appointment of new members. More than a year ago, the budget for the committee was eliminated and the committee has remained in financial limbo ever since. Finally, on July 1, 1982 the charter for the committee lapsed—not because of any conscious decision within the Department but because the charter renewal papers have taken an extraordinarily lengthy time moving through the chain of command within the Employment and Training Administration.

Twenty-two of twenty-five members of the Federal Committee on Apprenticeship are representatives of the private sector and by charter the Committee reports to the Secretary of Labor. It is ironic that at the same time that the Department of Labor has been promoting greater public-private cooperation and urging local CETA prime sponsors to work with Private Industry Councils, the Office of the Secretary of Labor has been incapable of working effectively with its own private sector advisory group.

Most regretably, such ineffectiveness in working with the Committee is missed potential. The members of the Federal Committee offer to your office a huge wealth of knowledge and experience in training and an enthusiastic resource interested in working with you. Your early policy statements emphasizing your concern for promoting training rather than income maintenance programs encouraged several committee members; but unfortunately, in the apprenticeship area, your actions have failed to match your rhetoric.

Curiously relative to other training activities of the Department, it would take little time or funding to give a major boost to apprenticeship. Such a move could have a large effect because any public dollars would be multiplied and extended manyfold by private efforts and funds. American apprenticeship is primarily a voluntary privately sponsored and privately financed institution and will remain so. But precisely because it receives so few public dollars, it also receives little attention from Labor Department officials.

The bald truth is that after more than a year and a half into this administration, the Department of Labor has not achieved any positive accomplishments in apprenticeship training. Indeed there is only a litany of losses for apprenticeship. You have all but wiped out almost every funded activity in the Department affecting apprenticeship including Apprenticeship Information Centers and Targeted Outreach Programs. These cuts of programs aimed at women and minorities not only reduce availability of information regarding apprenticeship but also make it likely that fewer women and minority men will be trained through apprenticeship. Apprenticeship New Initiatives contracts which promoted new apprenticeships and demonstrated that apprenticeship training could be linked with vocational education in high school were also cut. All of these cuts were made across the board without respect to program performance.

Even the GATB testing service traditionally offered to apprenticeship sponsors by Job Service offices has a questionable future. Your attempted revisions of the Davis-Bacon Act would have undermined apprenticeship in the construction industry and replaced apprentices with helpers for whom there is no training requirement. All sponsored research on apprenticeship has been closed down except one project which itself has been badly mismanaged by the Department. The Department has even eliminated the state and national apprenticeship data system so that the only information on numbers of aprentices is now collected through an inferior data system operated by the EEOC.

Department officials have talked of decentralizing apprenticeship administration to the states without any consideration of implications of such a move nor any coherent plan for how that might be accomplished constructively. Strengthening apprenticeship at the state level is a worthy goal but difficult issues remain to be worked out and some important national roles will remain. For example, some minimal national standards need to be met. In our highly mobile society, transferability of skills is important. An ironworker trained in North Dakota ought to be prepared and able to work at the same trade in California.

The Employment and Training Administration recently has been reorganized demoting the Bureau of Apprenticeship and Training to the bottom of the organization chart and inserting two to three additional layers of bureaucracy between the Bureau and the Assistant Secretary. Large number of staff vacancies including positions for state and regional directors have remained unfilled. BAT staff have been decimated by reduction-in-force notices and remaining workers have lived under constant threat of furlough or future layoff. It is difficult to imagine a worse environment for accomplishing anything constructive. Personnel cuts are likely to lead to fewer registered apprentices.

If apprenticeship is to help meet the nation's need for increased skill training, the number of apprenticeship training places must be significantly expanded and the orphan status that apprenticeship now endures in the Labor Department must be eliminated.

Perhaps most of all, we must come to realize that training is indeed a joint enterprize deserving and demanding the close cooperation of both the private and public sectors. Further, it is a joint venture that strongly influences our nation's defense capabilities, productivity, economy and trade position in world markets.

I urge you to reconsider the apparent low priority you have placed on apprenticeship and the work of the Federal Committee on Apprenticeship. I hope you will work cooperatively with the next Chairperson of the committee.

Sincerely,

ROBERT W. GLOVER,
*Chairperson, Federal Committee on Apprenticeship.*

Building & Construction Trades Department, AFL-CIO,
*Washington, D.C., October 7, 1983.*

Hon. Augustus F. Hawkins,
*Chairman, Subcommittee on Employment Opportunities, House of Representatives, Washington, D.C.*

Dear Congressman Hawkins: The Building and Construction Trades Department of the AFL-CIO has been advised of your intention to hold hearings this Fall on the nation's apprenticeship programs.

On behalf of the affiliates of the building and construction Trades Department, we too would like to have our individual views made known to the people of the United States. However, we are informed that at this time, only two days will be set aside for those hearings. We doubt seriously that a balanced view can be presented during the aforementioned time period.

Sufficient time should be allocated to allow not only the critics, but the sponsors of apprenticeship programs (where the majority of apprentices are), an opportunity to show how the intent of Congress has been frustrated and ignored by the Department of Labor for a number of years.

I could not, and would not, attempt to address all of the issues that should be examined, but the following is a list of areas of concern to use all:

(1) The proliferation of training responsibilities in apprenticeable occupations by the Assistant Secretary of Labor.

(2) Present regulations:

a. Title 29, Part 29: The issuance of Title 29, Part 29 of the Code of Federal Regulations by the Department of Labor in 1977 marked a significant change in the board policy outlined by the Congress regarding apprenticeship.

While Chapter 4C of the Federal Code (regarding apprentice labor) stipulates in part that "the Secretrary of Labor is authorized to formulate and promote the furtherance of labor standards necessary to safeguard the welfare of apprentices," Title 29, Part 29 results in the opposite effect. (Emphasis added.)

This regulation defines an apprenticesable occupation as one which can be taught with a minimum of 2000 hours of-the-job instruction. Replacing the minimum of 8000 hours of instruction, this new regulation fragments the traditional trades and allows each trade to be broken into many subcategories. The result is clear: whereas the traditional skilled craftsperson was equipped with enough skills to be versatile in the many facets of a trade, the new specialized worker will be skilled in only one area and is consequently much more vulnerable to the changing winds of the market place.

Trade fragmentation throughout this country does not serve to "safeguard the welfare of apprentices."

This is not just a problem for the worker. It is unwise government policy to cause a proliferation of apprenticeship programs simply by expanding the number of apprentive occupations. The prospect of hiring 3 or 4 workers to perform the same work as was previously performed by one will give nightmares to employers.

b. Title 29, Part 30: Equal Empoloyment Opportunity. The Department of Labor (Assistant Secretary, ETA) has seen fit to terminate all outreach programs which provided our affiliates with able and qualified minority and female candidiates. That action severely reduced employment opprtunities for many young and older minorities and women.

This administration has removed, as much as possible, all of the under pinning and support that the apprenticeship programs have enjoyed until now.

c. Title 29, Part 5: This title allowed for trainees to be used on federally funded construction sites in lieu of apprentices required by the bargaining agreement. This regulation, while it was in place, did serve all parties involved because it allowed an employer to reach out and secure persons for specific job sites.

(3) Davis-Bacon Protection: Another critical development which threatens the nature of apprenticeship is the recent decision by the U.S. District Court of Appeals on the Davis-Bacon Act. The Court eliminated the long-standing requirement that helpers may do only tasks distinct from those undertaken by other classes of workers.

This ruling will break down the distinction between apprentices and helpers, and undermine the apprenticeship system not only in the building trades, but throughout all the trades and industries in the entire country.

Due to these changes in the government's view of apprenticeship and other broader influences over the last several years, apprenticeship today faces formidable problems.

The depression in the construction industry during the last three years has severely diminished the number of apprentices. Some of the results of this are: (1) On-the-job training is an integral part of apprenticeship; (2) on-the-job training cannot be done if there are no jobs; (3) therefore, if there are not (or few) jobs, there will be no (or few) apprentices.

Because of the slump in the construction industry, the full effects of this decline have not yet been felt. But the scarcity of new apprentices gives a good indication of the problems associated with allowing the forces of the free market to govern the future of apprenticeship.

In addition, there has developed a "benign neglect" of apprenticeship over the last several years. Government and industry have both stepped back from what should be natural leadership roles. Labor unions, too, cannot be exempted from criticism in this regard. Some unions have allowed the focus of their attention to wander from the important area of the apprenticeship system to other concerns, such as severe high unemployment.

The future of apprenticeship is not yet clear. Some factors make future workforce needs difficult to assess. The present method of projecting the needs of the workforce over the next decade, for example, is fundamentally flawed.

Rather than seeking a measurement of the number of apprentices currently graduating from apprenticeship programs, the Department of Labor questions employers about the current available supply of workers for their construction projects. Because of the wide variations in labor supply, however, this method of measurement is subject to extreme distortions and is not reliable.

While it is difficult to assess the future workforce needs of our economy, it is clear from the problems outlined here that a stronger commitment must be made to apprenticeship in order to ensure the success of our nation's training system.

Because the country is heading into an election year, we are concerned that hearings at this time might not be as substantive as this important subject deserves. Among these concerns are the dramatic changes in the Federal government employment and training programs as enacted in the Job Training Partnership Act (JTPA). We believe more experience is necessary with these programs to evaluate their possible impact on apprenticeship and other employment opportunities.

A renewed commitment to apprenticeship is essential if our country is to continue to produce a skilled, well-rounded, versatile worker who is productive, efficient, and innovative. The apprenticeship system stresses a wide range of practical as well as theoretical skills and is uniquely qualified to provide the country with these highly skilled workers. A productive and innovative workforce is an absolute necessity if America is to meet the challenges of the 1990's—and beyond.

In the event that hearings are scheduled, however, the Building and Construction Trades Department will be prepared to offer full testimony on the status of apprenticeship today in the building trades.

Sincerely,

ROBERT A. GEORGINE, *President.*

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METAL TRADES DEPARTMENT,
AMERICAN FEDERATION OF LABOR AND
CONGRESS OF INDUSTRIAL ORGANIZATIONS,
*October 12, 1983.*

Hon. AUGUSTUS F. HAWKINS,
*Chairman, Subcommittee on Employment Opportunities, House of Representatives, Washington, D.C.*

DEAR CONGRESSMAN HAWKINS: The Metal Trades Department of the AFL-CIO has been advised of your intention to hold hearings this fall on the nation's apprenticeship programs.

On behalf of the affiliates of the Metal Trades, we would like to have our views made known. However, we doubt that only two days, which have been set aside for hearings, will be ample to achieve the balanced view we believe is necessary. Sufficient time should be allocated so sponsors of joint apprenticeship can demonstrate how the intent of Congress has been frustrated and ignored.

I could not and would not attempt to address all of the issues that should be examined, but two important areas are apprenticeability and lack of suitable training to support our defense preparedness.

The issuance of title 29, part 29 of the Code of Federal Regulation by the Department of Labor in 1971 marked a significant change in the broad policy outlined by Congress. Instead of safeguarding the welfare of apprentices as provided in Chapter

4C of the Federal Code, the Labor Department changed its role to providing quantity and not quality. Because of this change in philosophy many of the metal trades apprenticeable occupations have, or are now, been fractionalized or specialized. This has caused our stock of highly trained tool and die makers and machinists to decline.

Severe personnel ceilings on government support and service agencies without any latitude for using apprentices have led agencies to abandon their apprenticeship endeavors and to seek other sources for replacement personnel.

These and other forms of neglect over the past several years have made the future of apprenticeship in the United States unclear. There is a dire need for a renewed commitment to apprenticeship if our country is to continue to produce a skilled, well-rounded, versatile worker who is productive, efficient and innovative.

Since you are well aware of the implications that can be caused in an election year, we must stress the point that the hearings you are proposing might not lead to any substantive change, especially in the light that other employment and training programs might cause. Therefore, we believe more experience is necessary with these programs so they may be evaluated as to their impact on apprenticeship and other employment opportunities.

In the event hearings are scheduled the Metal Trades Department will be prepared to offer testimony on the status of apprenticeship in the metal trades.

Sincerely,

PAUL J. BURNSKY, *President.*

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CHRYSLER INSTITUTE,
CHRYSLER CORP.,
*August 18, 1983.*

Hon. JOHN N. ERLENBORN,
*Ranking Republican Member, Committee on Education and Labor, House of Representatives, Washington, D.C.*

SIR: It is gratifying to hear that some members of Congress are interested in the future of the skilled workforce of our Nation; and the problems involved in training their replacements, as indicated in your letter to Congressman Hawkins, in which you stated many of the problems as well as issues and questions that should be addressed by the Subcommittee later this year.

I would like to compliment you and the members of your staff on doing your homework on the problem. The points raised in your communication to Congressman Hawkins for discussion are areas that must be addressed and hopefully resolved in a manner that will provide incentive to cause the private sector to increase apprentice training throughout the country.

It is imperative that the Federal Bureau of Apprenticeship and Training be retained and strengthened. Fragmenting the system to the States will only create more obstacles in the system resulting in a greater resistance by both management and labor to utilize the apprenticeship system.

More emphasis must be placed on reducing the bureaucratic red tape instead of increasing the number of agencies that program sponsors must deal with in attempting to conduct an apprentice program.

Many program sponsors operate in many States and if it should become necessary to deal with individual State agencies I'm sure that more sponsors would discontinue apprentice training.

The cost of apprentice training has increased drastically over the last decade not just because of the training required to learn the trade, but we have found it necessary to conduct preapprentice and remedial training programs in order to assist our applicants to qualify. This is an additional expense that would not be part of apprentice training if our school systems were providing quality education in "K" through twelve.

In conjunction with the above comments I am enclosing a copy of my response to your questions and issues that were solicited by A.S.T.D.

Hopefully, the enclosed will be of assistance in your discussions with members of the Committee.

As you can determine I am very much interested in apprenticeship, its future and anything that I can do to preserve and improve the apprenticeship system.

Sincerely,

W. L. MAIN,
*Manager, Skilled Trades Training.*

Enclosure.

CHRYSLER INSTITUTE,
CHRYSLER CORP.,
*August 8, 1983.*

Mr. ROBERT L. CRAIG,
*Vice President, Government and Public Affairs, American Society for Training and Development, Inc., Washington, D.C.*

DEAR MR. CRAIG: In response to your recent letter soliciting informational material to be presented to members of the Subcommittee on Employment Opportunities for their discussions to be conducted later this year, I would like to present the following points for consideration on the specific questions and issues offered by Congressman Erlenborn:

*Question No. 1.* What broad policy considerations may impact upon attempts to strengthen apprenticeship policy?

Response. Strengthen the Federal Bureau of Apprenticeship and Training and deemphasize State Apprenticeship Councils. Many employers and International Unions operate in many states. By registering with the Federal Bureau it precludes multiple registeration, cuts down on paperwork requirements for each state as well as duplicate program reviews.

*Question No. 2.* What complaints, problems, and recommendations have been voiced concerning current apprenticeship programs and policies?

Response. Over Regulation.

(*a*) Dual EEO Reviews and Enforcement.

(*b*) Too much emphasis placed on quotas in preference to qualifications.

(*c*) Too many regulations imposed by individual states i.e., SAC's—California, Wisconsin, New York and Minnesota.

*Question No. 3.* What steps might be involved in efforts to insure, more effectively, that apprenticeship training is relevant to the skill requirements of the 1980s? To make sure that manpower availability and skill requirements are meshed?

Response.

(*a*) Federal financial assistance to Joint Consortiums made up of representatives from Community Colleges, Industry and Unions to develop updated curriculums for related training.

(*b*) Federal financial assistance directed toward more vocational and technical education for non-college bound students.

(*c*) Somehow influence improvement in basic education K through 12.

(*d*) Influence the utilization of qualified counsellors to assist students who wish to prepare for a career in the skilled trades in preference to going on to college.

*Question No. 4.* The future of apprenticeship in the 1990s—compare the U.S. program with Europe and Japan.

Response. Apprenticeship has been on the decline in the late 70's and early 80's and because of this there will be an upsurge as the economy strengthens. Many skilled people will be of retirement age within ten years. The European system is very good and many aspects of it should be adopted in this country. Japan does not have an apprentice program as we know it in this country.

*Question No. 5.* Are there any general actions which might be recommended so that policy makers might have a better understanding of apprenticeship and its role, broadly, in manpower training?

Response. Invite Joint Committees to meet with policymakers to discuss and demonstrate what an apprenticeship program consists of i.e., selection requirements, related training levels required for completion and the type of on-the-job requirements to successfully complete the program. Also, the earning potential of a qualified skilled trades person.

*Question No. 6.* The need for new standards and techniques in: Training and instruction; Wages; Pre-apprenticeship.

Response.

(*a*) Updated standardized curriculum for related instruction at the Community College or Vocational Technical College.

(*b*) There is a need for developers and instructors for delivery of related training for remote areas with insufficient educational facilities to conduct classes.

(*c*) The Development and Delivery of Pre-apprentice Training—invariably this will consist of math and reading skills that should have been acquired in "K" through twelve education.

*Question No. 7.* What is meant by a shortage of skilled workers? Is there one now? Will there be a shortage in the next ten years?

Response. With the rapid change in technology and the trend to emulate the Japanese and other industrial countries we are finding our skilled employees require constant upgrading to keep up with the state of the art and in many cases the worker prefers not to go back to school or is incapable of assimilating the training required to keep up with the state of the art for his trade. Further, with the slowdown of training during the past decade we will experience a definite shortage within the very near future.

*Question No. 8.* Is there a need for government training programs in apprenticeship? Has the Job Corps program been successful?

Response.

(*a*) Yes in all branches of the military.

(*b*) Yes other government agencies that will continue to employ them as journey persons.

(*c*) Personally the Job Corps has not been successful. It has cost too much per person for the little return potential.

*Question No. 9.* Should government agencies be required to conduct and register apprenticeship programs? In defense and civilian agencies?

Response.

(*a*) All branches of the military should register and conduct apprentice training. The individual and the taxpayer both benefit from these programs.

(*b*) All government contracts to private industry for defense or construction should have a mandatory apprentice program included.

(*c*) All government run agencies such as: Veteran's Hospitals, Sub-Depots or agencies that utilize journey persons should be required to conduct apprentice training.

*Question No. 10.* The role of the government in the present program? Is there too much red tape?

Response. Yes, there are too many reports, too many reviews especially in the areas of EEO and Veterans Benefits. Especially in states with State Apprenticeship Councils.

*Question No. 11.* The role of women in apprenticeship: types of Jobs, types of Barriers.

Response. Equal opportunity for all. All candidates must meet the qualification standards established to enter the program and be able to perform all work assignments of the trade. No company or union can afford to employ individuals that must be given favoring assignments.

*Question No. 12.* How does an older worker or a displaced worker obtain Journeyman status?

Response. Some industries and some trade unions permit the issuance of Journeyman Status from specified numbers of years working on the trade. Older workers in most industries have the same opportunity as the young worker. Most older workers do not want to go back to school to meet the requirements of the trade. In the auto industry the apprentice must earn two-thirds of an associate degree just completing the basic related training requirements for the trade. This requirement often discourages the older worker because they do not wish to return to school.

*Question No. 13.* The effects of alien certification on the apprenticeship program.

Response. No comment or experience with this situation.

*Question No. 14.* Should the apprenticeship program be turned over to the individual states to be operated by them?

Response. The program as operated at the federal level is the most desirable especially if tax exceptions or tax credits are considered. Also, as commented before, many organizations operate apprentice programs on a national basis and it is preferable to operate with one government agency instead of many individual state agencies.

*Question No. 15.* How can apprenticeship registration procedures be improved and demand occupations be addressed?

Response.

(*a*) Registration with one agency.

(*b*) Offer assistance to candidates as to where apprenticeships are available nationally.

(*c*) Offer assistance as to how to obtain Pre-apprenticeship training prior to making application.

*Question No. 16.* Financial Incentive: Tax Deduction—full or partial; Tax Credit or exemptions.

Response.

(*a*) Tax Credit for total cost of training an apprentice.

(*b*) Also, establish a quota for apprentices to be trained by an organization and then pay an incentive for the number trained in excess of the quota established.

Hopefully, the responses to the issues raised by Congressman Erlenborn will be of assistance in your future discussions with members of the Committee.

As you can determine from my responses I am very much interested in apprenticeship, its future and anything that I can do to preserve and improve the apprenticeship system.

Sincerely,

W. L. MAIN,
*Manager, Skilled Trades Training.*

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NATIONAL TRAINING FUND,
SHEET METAL & AIR CONDITIONING INDUSTRY,
*Washington, D.C., November 10, 1983.*

Hon. AUGUSTUS, F. HAWKINS,
*Chairman, Subcommittee on Employment Opportunities, House Committee on Education and Labor, Washington, D.C.*

DEAR SIR: Thank you for your letter of September 20 in which you afforded the opportunity to respond to the Subcommittee on Employment Opportunities as part of oversight hearings being conducted on the National Apprenticeship Act. A statement which addresses our concerns on this important issue has been prepared for your consideration and information.

Your thoughtfulness is appreciated.

Sincerely,

W. L. FILLIPPINI, *Administrator.*

Enclosures.

## STATEMENT OF W. L. FILLIPPINI, ADMINISTRATOR, NATIONAL TRAINING FUND, SHEET METAL & AIR CONDITIONING INDUSTRY

Mr. Chairman and Members of the Subcommittee: The National Training Fund of the Sheet Metal and Air Conditioning Industry is pleased to have this opportunity to present our thoughts regarding the importance of employee training programs and specifically the National Apprenticeship Act.

It is our opinion that the National Training Fund (NTF) is a unique program which should be looked upon by your Subcommittee and the entire Congress as a model for all industries.

This candid opinion is based on unprecedented facts which have been developed and proven during the 12 years that this comprehensive, joint labor-management program has been in existence.

To provide you with a better idea of the scope of the National Training Fund and its programs, I have provided, along with my statement, a copy of the 1983 NTF Annual Report and a copy of Volume 7 of the NTF Training Tips, a publication which is distributed to approximately 900 training instructors nationwide.

On May 12, 1971, a joint trusteeship was signed between management—the Sheet Metal and Air Conditioning National Contractors' Association (SMACNA)—and labor—the Sheet Metal Workers' International Association (SMWIA)—for the purpose of creating a national depository of monetary contributions. The monies derived were and are intended solely for the training of apprentices, retraining of journeyman mechanics, industry vocational instructor training, research into new technologies, plus other related subjects.

Our program's uniqueness includes the fact that 100 percent of all contractors signatory to a collective bargaining agreement throughout the United States, plus certain provinces of the Dominion of Canada, contribute on an hourly basis to the NTF. The hourly contribution rate is presently 4 cents per hour of work for each sheet metal journeyman and apprentice. A rate of 5 cents per hour has been negotiated for 1984, and 6 cents per hour for 1985.

As we have approximately 10,000 apprentices presently in training and represent in excess of 100,000 journeyman workers, our annual income per one cent contribution amounts to approximately $1.2 million.

At the hourly contribution rate of 4¢ for 1983, this comes out to $4.8 million. For 1984 at the rate of 5¢ an hour, the amount will be $6 million and for 1985 at the rate of 6¢ an hour, the total will be $7.2 million. This is in addition to approximately $12 million contributed at the local level in support of our 200 Joint Apprenticeship and Training Committees (JATCs). These Committees function at some 250 school sites throughout the country.

To date, $32 million has been spent on national standardized curricula development, supplemental audiovisual teaching supports (utilizing the latest techniques of laser beam/disc playback units), an intensive instructor training program under contract for 11 years with Ohio State University, plus research (training potentials) involving professional institutions of national repute.

The program is extremely successful due to the strong and active support of both its parent organizations, SMWIA and SMACNA, plus the fact that our policy is to work with and through our JATCs as constituted on state, local, and provincial levels. One of our mottoes is to work through and with "the local school board" concept.

We have proven that our industry itself is the only knowledgeable and capable decision-maker relative to its present and ever-changing needs. In order to justify this concept, labor and management are supporting this national endeavor with monies from within the industry; are directly and indirectly relieving the local taxpayer of millions of dollars by supplementing public school expenditures; and most important, they are making a nationalistic contribution of no little consequence as it effects manpower development.

However, in spite of all of this private sector, independent effort, very little, if anything, could have been accomplished if it were not for the long proven system of apprenticeship established by the Department of Labor through the Bureau of Apprenticeship Standards.

To destroy or weaken that fundamental, proven arm of manpower needs in our country would be counterproductive. Our program would likewise be fragmentized and severely weakened if the responsibilities of this important agency were eliminated or weakened.

It is our opinion that apprenticeship training within the United States must be strengthened if the United States is to meet the future manpower needs brought about by changing technology and foreign competition. To be effective, apprenticeship training must have substance. Related training and the on-the-job training must complement each other. Some "apprenticeship" programs are little more than entry level titles with little or no training. Our industry's apprenticeship tenure is four years—a period of training time, negotiated and agreed to through the collective bargaining process. It, plus other standards, is constantly being re-evaluated by both management and labor, collectively.

We in the sheet metal industry have always believed that increases in productivity and employment are directly related to training. A sound apprenticeship program promotes job satisfaction, provides the employer with qualified manpower and insures the customer of a quality product.

We also believe that increased federal involvement in registering (and monitoring) apprenticeship training would help insure a training effort that is rigorous, job-related, progressive, and substantial. Anything less is a disservice to our country in general and the apprentice in particular.

The Honorable John N. Erlenborn, the ranking minority member of the full committee, recently stated in part that, "Government also has related objectives in apprenticeship which have been established by law over the years. Government—federal, state and local—encourages the expansion of apprenticeship because it is a time-tested, cost-efficient method of producing skilled workers."

We fully agree with that statement and respectfully oppose any effort to fragmentize or dismantle existing federal programs regarding apprenticeship training.

On behalf of the National Training Fund, I would welcome the opportunity to provide further information that you may deem helpful.

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UNITED BROTHERHOOD OF CARPENTERS AND JOINERS OF AMERICA,
*December 5, 1983.*

Hon. AUGUSTUS F. HAWKINS,
*House of Representatives,*
*Washington, D.C.*

DEAR MR. HAWKINS: In regard to the hearings on the National Apprenticeship Act, we appreciate your leaving the record open for further comments. As we review the recommendations made at the hearings, there are specific issues which we wish you to consider.

The first issue is:

It is our opinion that the Bureau of Apprenticeship Training should be strengthened as to personnel and administrative capabilities so that the Bureau can carry out the activities for which the Bureau was originally created, i.e. to advise apprenticeship programs as to legalities and operational procedures for apprenticeship programs, and to monitor programs to make certain that they are carrying forth apprenticeship activities which are legal and consequently, in the best interest of the apprentices and the industry sector for which they are preparing.

In 1981 there was an extreme reduction in personnel and departmental capabilities in the Bureau of Apprenticeship Training. Further, the Bureau was administratively weakened by being structured as a low level sector of the Employment and Training Administration. The Director of the Bureau was required to penetrate several layers of administrators and had little, if any, direct voice with the Secretary of Labor.

With the weakening of the Bureau as to personnel and policy admininstration, there have been sectors in industry that would like to use an apprenticeship registry as a means of accommodating certain legal requirements. In the guise of apprenticeship, bogus programs have been established and the Bureau has not had the personnel or the mandate to keep the proper surveillance, and evaluate each apprenticeship program's specific process. The above has resulted in a developing of a lack of respect for the apprenticeship system, which of course this organization considers to be the most appropriate manner by which persons wishing to enter industry are prepared for performance in that industry.

The second issue is:

We firmly recommend that the Bureau be established as a specific and independent agency, reporting directly to an undersecretary, rather than an appendage to some other Bureau or department, in an obscure position.

The third issue is:

A recommendation has been made that there be direct funding of apprenticeship programs by the federal government with matching state funds. We firmly oppose that tax dollars be spent upon an activity which should be funded by the industry served by that activity; in this instance the activity is apprenticeship, and training, in general.

The apprenticeship training as carried forth by most of the construction unions is industry funded, for the greater part, by negotiated agreement between management and labor, with both management and labor contributing to the undertaking. Because many negotiated funds are relatively old, there are some who considered them to be management contributions only, not knowing that originally most of these negotiated funds were established with the affiliate members contributing a few cents per hour from their incomes and management matching the contribution at the same level. The negotiated fund of this structure is a practice that continues in the industry. For instance, in 1979 in the State of Washington, the negotiated contribution had been at the level of 2¢ per hour. To implement the manipulative training program (PETS) developed by this union and endorsed by the signatory section of management, the area's joint labor-management training committee determined that there would need to be an increase in the revenue of the joint training fund. The committee determined that the funding per hour should be increased from 2¢ to 6¢, and the joint committee further offered that this increase in negotiated funding should be borne equally by labor and management. Resultant of the conclusion drawn by the joint committee, the management chapters and the affiliated local unions agreed to "open" the in-place negotiated contract solely to this consideration. Consequently, the decision on the part of labor was made by the membership in a special election. The members of this union in those affiliated bodies in that area voted on a percentage or ratio of 4 to 1 to match the contribution, taking a 2¢ reduction in their take home pay. With these unselfish actions on the part of management and labor, the funding level was increased so that the industry could be best served with the employer and the employees sharing the costs and the benefits. We cite the above as being typical of industry contribution historically in effect.

In some geographic areas in the negotiated contract the amount of cents per hour worked to be allocated to apprenticeship training is determined by the membership in this manner: The employers offer a maximum per hour rate which covers both take home wages and fringe benefits. The members determine how the fringes shall be allocated; as to cents per hour for apprenticeship, cents per hour to health care and pension, etc. When a package of this nature is negotiated, it is purely a membership contribution that supports training, because if the members did not vote to donate a portion of their wages to training, they could put that money in their pocket. It is our opinion that either of the above described negotiated funding practices is a just and adequate way to service the industry with trained personnel in a way not dependent on tax dollars.

We advise against, as stated earlier, tax dollars being used to support specific segments of industry at the expense of all taxpayers, particularly as it has already been demonstrated that there is a manner by which apprenticeship is well funded at no expense to the taxpayers.

In summary we recommend that:

1. The Bureau of Apprenticeship Training be funded to an adequate level so that it has the funding and personnel necessary to register, guide and maintain bona fide apprenticeship training programs.
2. The Bureau be made an independent Bureau reporting directly to the Secretary of Labor and fulfilling the role described in the original legislation that established the Bureau.
3. There be no funding of tax dollars to provide for the implementation of apprenticeship programs, even as an incentive, because we feel that the industry that utilizes the workers should and will bear the cost of the training for incoming workers.

If your committee has further questions concerning the above remarks, this office shall be prepared to respond in a specific manner.

Sincerely yours,

PATRICK J. CAMPBELL,
*General President.*

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INTERNATIONAL UNION OF OPERATING ENGINEERS,
*Washington, D.C., November 18, 1983.*

Hon. AUGUSTUS F. HAWKINS,
*Chairman, Employment Opportunities Subcommittee, House of Representatives, Washington, D.C.*

MY DEAR MR. HAWKINS: Thank you for the opportunity to appear at your subcommittee hearings on apprenticeship. I appreciate the fact that you have directed the record to be kept open for comment, and I am submitting the attached material as a part of the testimony of the Joint Apprenticeship and Training Committee panel chaired by Mr. Ray Robertson on November 17, 1983.

Thank you for your concerns and your actions.

Sincerely yours,

REESE HAMMOND,
*Director, Education and Training.*

Enclosure.

### THE FEDERAL ROLE IN APPRENTICESHIP EQUAL OPPORTUNITY

I. These oversight hearings on apprenticeship come at a critical juncture for the American work force.

A. The legitimate demands for greater participation in the skilled crafts by minorities were headline stories in 1963, and for the past twenty years those associated with apprenticeship and society in general have grappled with the issue.

B. Twenty years is a long time to study a problem.

C. Some people have gained twenty years experience, while others have repeated one year's experience twenty times.

II. There has been very real progress in opening up the building trades to minority males in these twenty years and, more recently, to females.

A. In my union, minority participation in apprencticeship as of June 1983 was 31 percent.

B. Female participation is 15 percent.

C. Overall, in the building trades, minority participation exceeds 18 percent.

III. But at the same time that minority and female apprenticeship participation has been going up—at the direction of the federal government—the quality of apprenticeship has been going down!!

IV. Unequal training is the worst form of discrimination. Yet, in the past 13 years, the federal government has systematically diluted craft skills.

A. On October 2, 1971, the process started with the U.S. DOL coining the concept of a construction "trainee" offered as an alternative to apprenticeship.

B. The "trainee" position required none of the discipline of apprentices, none of the related theory required of apprentices, and offered no protection individual registration and appeal available to all registered apprentices.

C. And so, 13 years ago the federal government began to undermine skill training by eliminating the requirement that all candidates for craft worker status must receive technical theory as well as on-the-job training skills.

D. In 1974, in a misguided attempt to open up a "fast track" to journeyman skills, the USDOL manufactured the title of "enrolee" in training programs supposedy leading to craft status, but

1. With no OJT schedule, nor

2. Any theoretical training.

E. In 1977, another blow was stuck at the quality of apprenticeship when the USDOL announced that the minimum term of apprenticeable occupations was chopped from 4,000 hours of OJT to 2,000 hours of training, thus cutting by 50% the time available for a potential craft worker to attain the knowledge and skills previously identified with journey person status.

F. The specter of fragmentation of apprenticeable occupations became a reality in 1980 when the USDOL published a list of 'apprenticeable occupations" totaling some 700 job titles, many of which were simply a small portion of skilled craft workers' occupations.

1. Dr. Glover properly pointed out earlier in these hearings that, as of December 1978, there were no apprentices registered in 149 of the job titles listed.

2. Fragmentation has been addressed in our testimony, so I won't belabor the topic, I'll simply point out that it diminishes dedication and commitment required of individuals, and further weakens the drive for truly skilled workers.

G. Other ill-advised activities of the federal government that adversely affect apprenticeship include that portion of the proposed Davis-Bacon regulations that would permit utilization of low wage helpers on construction projects instead of apprentices, thus removing the economic incentive to employ apprentices, and the vacuous treatment of the Federal Committee on Apprenticeship for the past ten years.

V. In short, for the past thirteen years, federal activities in the apprenticeship area have:

A. Diluted skills;
B. Diminished status;
C. Disillusioned thousands;
D. Depleted the wealth of our skilled work force; and
E. Raised serious questions about the reality of equal opportunity.

As Representative Erlenborn recently stated "we are . . . eating our seed corn."

VI. Quality without equal opportunity is elitism. Equal opportunity without quality is a fraud.

In the last resort, if you take the letters q-u-a-l-i-t-y out of "equality" all you have left is an "e"—and everyone knows what kind of grade that is.

VII. Congress can correct this situation by "caring" about how our nation develops its skilled work force. These hearings are a welcome step towards enlightened public policy if when they are completed, someone really cares.

VIII. We would welcome the opportunity to work with congress and the federal government to restore positive direction for real EEO in our trades.

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NOVEMBER 4, 1983.

Mr. LAWRENCE BARKER,
*Commissioner of Labor, State of West Virginia, The Department of Labor, Charleston, W. Va.*

DEAR MR. BARKER: Thank you for your correspondence with respect to apprenticeship programs.

The Subcommittee on Employment Opportunities, chaired by Representative Augustus Hawkins, will be holding oversight hearings on the Nation's apprenticeship programs on November 15 and 17. I have referred your correspondence to that Subcommittee, to be included in the record in connection with these hearings.

I appreciate your sharing your views with me.

Sincerely,

CARL D. PERKINS, *Chairman.*

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STATE OF WEST VIRGINIA,
THE DEPARTMENT OF LABOR,
*Charleston, October 13, 1983.*

Hon. CARL D. PERKINS,
*Chairman, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR CONGRESSMAN PERKINS: I have observed, under the policies of the present administration, that the Bureau of Apprenticeship and Training has been the subject of at least 20 percent decreases and a much higher percent loss through more stringent rules and regulations.

It is my belief that the present administration has every intent of "throwing the baby out with the bathwater." I have worked with the United States Department of Labor continuously since 1961, and up until the present time I have always been able to work in perfect harmony with the U.S. Department of Labor officials in West Virginia.

I have served under five administrations in this state and I believe that I have a better perception of the type of service that I must render to my people than any other state labor official.

I have urged Secretary Donovan to stand up for those programs which have contributed so much to the working people. The nationwide standards of the Bureau of Apprenticeship and Training far outweigh both the watered down approach of the present administration and the efforts of a few states to set their own standards.

After careful consideration and investigation into the status of the apprenticeship program and its operation today, I must say that the West Virginia programs are operating under BAT far better than the surrounding states which have state apprenticeship councils. I do not believe in the concept of state apprenticeship councils and I shall continue to cooperate with BAT and the building and construction trades apprenticeship committees.

There is no doubt that BAT needs stimulation. Therefore, the future of apprenticeship lies within the actions of the oversight hearings and I urge the nationalized standards rather than a hodgepodge of state rules and regulations.

Respectfully,

**Lawrence Barker,**
*Commissioner of Labor.*

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**National Association of State and
Territorial Apprenticeship Directors,**
*Albany, N.Y., November 18, 1983.*

Hon. **Augustus F. Hawkins,**
*Chairman, Committee on Education and Welfare, House of Representatives, Rayburn House Office Bldg., Washington, D.C.*

**Dear Congressman Hawkins:** During my testimony before your Subcommittee on Employment Opportunities on November 15th, I mentioned two Hi Tech studies which were conducted in New York State. Enclosed are copies of those documents for inclusion in the Hearing Record.

There are many opportunities to expand apprenticeship in the Hi Tech Industries. In addition to the already-apprenticeable occupations found in these industries, there are many more present and emerging occupations which can and should be made apprenticeable. Several States are working hard in this area now.

NASTAD appreciates the opportunity provided to us to express our views. The Apprenticeship Program needs Congressional attention and oversight if it is to yield the human and productive benefits it could produce. We are ready to work with your Committee to develop lasting solutions.

Sincerely,

**Donald J. Grabowski,**
*President, NASTAD.*

Enclosures.

# High-Technology Industries In New York State

STATE OF NEW YORK
Mario M. Cuomo, Governor

DEPARTMENT OF LABOR
Lillian Roberts, Commissioner

# Introduction

RECENTLY, in response to high unemployment and budget restrictions at all levels of government, administrators and planners have begun to review their plans for improving the state's economy. Special attention is being focused on strategies for attracting new industries and expanding those already located in New York State. Particular emphasis is being placed on industries associated with the high-technology field, as these are a promising source of substantial and sustained demand for skilled labor.

This report contains information on the occupations found in the 52 high technology industries that have been selected by the Battelle Corporation for their high potential for long-term growth in the state.[1] Occupational staffing patterns, significant occupations, apprenticeship occupations, educational requirements, on-the-job training, occupational outlook, and supply and demand are among the topics covered in this report. Two significant features are a table providing data on assemblers at the various skill levels, by industry, and a table showing educational and training routes in key occupations in high technology industries.

This report presents occupational information at the three-digit SIC industry level except where otherwise noted.[2] Detailed staffing pattern data on four-digit SIC industries are not available.

The 52 four-digit SIC industries are found within 29 three-digit SIC industries. For the purposes of occupational comparisons, these 29 industries are considered as being high technology in this report. In the state, employment in the 52 industries averaged 407,700 in 1980 or 68 percent of the approximate employment of 600,000 in the 29 industries covered in this report.

Three-digit industry employment data are from *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement* and *Occupational Employment Statistics, Services, New York State, April-June 1978*. Four-digit industry employment is derived from employer reports of workers covered by the New York State Unemployment Insurance Law.

Of the 29 three-digit industries, 28 are in manufacturing and one is in services. Occupational comparisons, throughout this report, are made between these 29 industries and the 63 remaining three-digit SIC manufacturing industries for which data were published in *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*.

Another report, *High-Technology Industries in New York State*, is also available for $5. It reviews the status of high-technology industries in the state, particularly the 52 selected by the Battelle Corporation. The report includes information on employment and earnings in these 52 industries[3] by four-digit SIC industry code and by area. To the extent that comparable data were available, comparisons have also been made with high-technology industries nationwide.

This information is directed to education, employment and training program planners and administrators, guidance and employment counselors, teachers, students, job seekers, employers, and others to assist in their efforts to plan programs related to the occupations in high-technology industries. ☐

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[1] The Battelle Corporation was commissioned by the New York State Science and Technology Foundation to design a strategy for the development of high technology activity in New York State.

[2] *Standard Industrial Classification Manual (SIC)*.

[3] See Industries Surveyed, pages 3 and 4, for listings of the 29 three-digit and 52 four-digit industries.

# Highlights

- High technology industries rely heavily on professional and technical workers. About 22.5 percent of the employment in these industries was comprised of workers in this category in 1980.

- The percentage of skilled workers is greater in high-technology industries than in nonhigh-technology manufacturing industries. However, the opposite is true for unskilled workers, who accounted for only about 8.3 percent of high-technology employment in 1980 as opposed to about 15.6 percent of nonhigh-technology employment.

- Many of the occupations with significant levels of employment in high technology industries occur in nearly all manufacturing industries. They tend, however, to be found in larger numbers in high technology industries.

- Much of the employment in high technology industries is closely associated with electrical and electronic machinery or other products that incorporate electrical and electronic components. The significant occupations include electrical and electronic engineers, electrical and electronic technicians, electro-mechanical equipment assemblers, electrical and electronic assemblers, and electronic wirers.

- Assemblers (skilled, semiskilled, unskilled) represent over nine percent of all employment in high technology industries.

- With their reliance on professional and technical workers, high-technology industries have a greater demand for college-trained workers than do nonhigh-technology industries.

- Occupations that are in demand in high-technology industries include electrical and electronic engineers, computer scientists, computer programmers, systems analysts, industrial engineering and mechanical engineering technicians, and electrical and electronic technicians.

- New York State has a large supply of workers qualified for high-technology employment and a strong educational system capable of educating and training an adequate number of students for future job openings. □

# Industries Surveyed

## Three-digit SIC

The 29 industries, upon which the majority of this report is based, are listed below along with their three-digit standard industrial classification (SIC) code designation:

| SIC code | Industry |
|---|---|
| 272 | Periodicals |
| 275 | Commercial printing |
| 281 | Industrial inorganic chemicals |
| 283 | Drugs |
| 284 | Soap, cleaners, and toilet goods |
| 286 | Industrial organic chemicals |
| 287 | Agricultural chemicals |
| 289 | Miscellaneous chemical products |
| 346 | Metal forgings and stampings |
| 353 | Construction and related machinery |
| 355 | Special industry machinery |
| 356 | General industrial machinery |
| 357 | Office and computing machines |
| 361 | Electric distributing equipment |
| 362 | Electrical industrial apparatus |
| 364 | Electric lighting and wiring equipment |
| 365 | Radio and TV receiving equipment |
| 366 | Communication equipment |
| 367 | Electronic components and accessories |
| 369 | Miscellaneous electrical equipment and supplies |
| 371 | Motor vehicles and equipment |
| 372 | Aircraft and parts |
| 376 | Guided missiles, space vehicles, parts |
| 381 | Engineering and scientific instruments |
| 382 | Measuring and controlling devices |
| 383 | Optical instruments and lenses |
| 384 | Medical instruments and supplies |
| 386 | Photographic equipment and supplies |
| 737 | Computer and data processing services |

## Four-digit SIC

All but one of the 52 industries surveyed were engaged in manufacturing. They accounted for two of every seven jobs in manufacturing in the state (27.9 percent). The one nonmanufacturing industry (SIC 7372) provided computer programming and software services.

The following is a list of the 52 industries, including their four-digit standard industrial classification (SIC) code designation:

| SIC code | Industry |
|---|---|
| 2721 | Periodicals |
| 2752 | Commercial lithographic printing |
| 2819 | Industrial inorganic chemicals, n.e.c. |
| 2831 | Biological products |
| 2833 | Medicinals and botanicals |
| 2844 | Toilet preparations |
| 2869 | Industrial organic chemicals, n.e.c. |
| 2879 | Agricultural chemicals, n.e.c. |
| 2891 | Adhesives and sealants |
| 3465 | Automotive stampings |
| 3466 | Crowns and closures |
| 3531 | Construction machinery |
| 3532 | Mining machinery |
| 3551 | Food products machinery |
| 3559 | Special industry machinery, n.e.c. |
| 3569 | General industrial machinery, n.e.c. |
| 3573 | Electronic computing equipment |
| 3576 | Scales and balances, except laboratory |
| 3579 | Office machines, n.e.c. |
| 3613 | Switchgear and switchboard apparatus |

**Four-digit SIC--Continued**

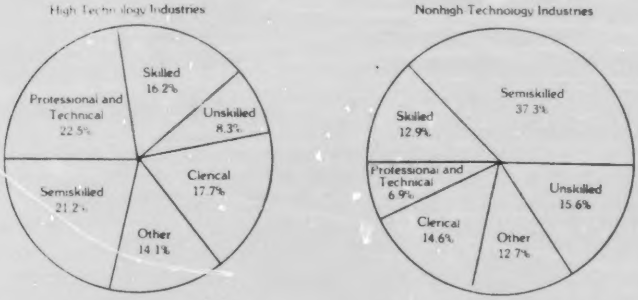
| SIC code | Industry |
|---|---|
| 3622 | Industrial control |
| 3623 | Welding apparatus, electric |
| 3641 | Electric lamps |
| 3643 | Current-carrying wiring devices |
| 3644 | Noncurrent-carrying wiring devices |
| 3645 | Residential lighting fixtures |
| 3647 | Vehicular lighting equipment |
| 3652 | Phonograph records, video apparatus |
| 3661 | Telephone and telegraph apparatus |
| 3662 | Radio and TV communication equipment |
| 3674 | Semiconductors and related devices |
| 3678 | Electronic connectors |
| 3679 | Electronic components, n.e.c. |
| 3692 | Primary batteries, dry and wet |
| 3693 | X-ray apparatus and electromedical equipment |
| 3713 | Truck and bus bodies |
| 3715 | Truck trailers |
| 3721 | Aircraft |
| 3764 | Space propulsion units and parts |
| 3769 | Space vehicle equipment, n.e.c. |
| 3811 | Engineering and scientific instruments |
| 3822 | Environmental controls |
| 3823 | Process control instruments |
| 3824 | Fluid meters and counting devices |
| 3825 | Instruments to measure electricity |
| 3829 | Measuring and controlling devices, n.e.c. |
| 3832 | Optical instruments and lenses |
| 3841 | Surgical and medical instruments |
| 3842 | Surgical appliances and supplies |
| 3843 | Dental equipment and supplies |
| 3861 | Photographic equipment and supplies |
| 7372 | Computer programming and software |

NOTE: n.e.c. (not elsewhere classified) is used to group industries not classified in other 4-digit codes that fall within the 3-digit classification. □

# Occupational Staffing Patterns

AN important characteristic of the 52 high-technology industries is their relatively high reliance on professional and technical workers. As shown in the chart below, workers in this category comprised approximately 22.5 percent of total employment in the 29 three-digit SIC industries in which the specific 52 four-digit high-technology industries are found. Of the estimated 685,500 employees in the 63 remaining New York State three-digit SIC manufacturing industries, only about 47,000, or 6.9 percent, are in the professional and technical category.

**Occupational Distribution in High-Technology and Nonhigh-Technology Industries New York State, 1980**



On the following page, Table 1 shows employment by occupational category in the 29 three-digit SIC industries and in the 63 remaining three-digit SIC manufacturing industries.

Among specific three-digit industries, the percentages of professional and technical workers vary greatly. For example, office and computing machines (SIC 357), with about 80 percent of its employment in electronic computing equipment (SIC 3573), has about 45 percent of its workers in the professional and technical category. At the low end of the range, commercial printing (SIC 275), with about 66 percent of its employment in commercial lithographic printing (SIC 2752), has only about 3.1 percent in the professional and technical category.

Another important characteristic of high-technology industries is their requirement for semiskilled, clerical and skilled craft workers. Analysis of estimated employment levels shows that the second largest percentage of employment is in the semiskilled worker category in high-technology industries. Clerical workers (office and plant) make up the next largest category followed closely by skilled workers. Unskilled workers represent only a little over 8 percent of total employment in high-technology industries compared with over 15.6 percent in other manufacturing industries.

The largest percentage of workers in nonhigh-technology industries is in the semiskilled category, whereas high-technology industries have a higher percentage of skilled workers. ◻

Table 1. EMPLOYMENT IN 29 HIGH TECHNOLOGY INDUSTRIES AND 63 REMAINING MANUFACTURING INDUSTRIES, BY OCCUPATIONAL CATEGORY NEW YORK STATE, 1980

| Occupational category | 29 High technology industries | | 63 Nonhigh technology manufacturing industries | |
|---|---|---|---|---|
| | Employment | Percent of total | Employment | Percent of total |
| Total | 600,120 | 100.00 | 685,360 | 100.00 |
| Professional and technical | 134,970 | 22.49 | 46,950 | 6.85 |
| Professional | 93,130 | 15.52 | 37,590 | 5.48 |
| Technical | 41,840 | 6.97 | 9,360 | 1.37 |
| Skilled | 97,470 | 16.24 | 88,450 | 12.91 |
| Semiskilled | 127,330 | 21.22 | 255,370 | 37.26 |
| Unskilled | 49,700 | 8.28 | 107,190 | 15.64 |
| Office clerical | 83,160 | 13.86 | 71,210 | 10.39 |
| Plant clerical | 23,070 | 3.84 | 29,000 | 4.23 |
| Other | 84,420 | 14.07 | 87,190 | 12.72 |

# Significant Occupations

MUCH of the employment in high-technology industries is closely associated with electrical and electronic machinery or other products that incorporate electrical and electronic components. For example, frequently occurring professional and technical occupations include electrical and electronic engineers and electrical and electronic technicians. The skilled category includes a significant number of electro-mechanical equipment assemblers. Numerous electronic wirers and inspectors are found among the listed semi-skilled occupations (see Table 2 [1]).

With the emphasis on quality control, skilled non-working supervisors and semiskilled inspectors make up large percentages of total employment in high-technology industries. In fact, supervisors were among the top 10 occupations in 17 industries and inspectors in 16. In 1980, there were about 11,000 inspectors in high-technology industries compared to about 7,000 in nonhigh-technology industries. Such workers are noted in virtually all industries but not usually in the large numbers shown in high-technology industries.

An occupational group that may be underemphasized in studies or discussions of high-technology is unskilled assemblers. Though unskilled workers represent slightly more than 8 percent of total employment in high-technology industries (as compared with over 15.6 percent in other manufacturing industries), unskilled assemblers rank among the top 10 occupations in nine high-technology industries (See pages 12 to 16 for more detail on assemblers). □

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[1] Table 2 only ranks occupations in 28 of the 29 three-digit industries that include the 52 four-digit high-technology industries. Insufficient data was available for the 29th industry, photographic equipment and supplies (SIC 386). The 10 occupations with the largest employment in each of the 28 industries are listed in Appendix Tables 1-28.

Table 2. OCCUPATIONS RANKED IN THE TOP 10 IN EMPLOYMENT
IN AT LEAST ONE HIGH-TECHNOLOGY INDUSTRY
NEW YORK STATE, 1980

| Occupation [1] | Number of industries in which occupation ranks in top 10 |
|---|---|
| Accountant and auditor | 6 |
| Accounting clerk | 4 |
| Aircraft structure and surface assembler | 1 |
| Assembler | 1 |
| Bindery worker, assembly | 1 |
| Biological science technician | 1 |
| Biological scientist | 1 |
| Bookbinder, machine | 1 |
| Bookkeeper, hand | 2 |
| Chemical operator A | 4 |
| Chemical operator B | 2 |
| Chemical operator helper | 1 |
| Chemist | 5 |
| Chief operator | 2 |

See footnotes at end of table.

Table 2 OCCUPATIONS RANKED IN THE TOP 10 IN EMPLOYMENT IN AT LEAST ONE HIGH TECHNOLOGY INDUSTRY NEW YORK STATE, 1980–Continued

| Occupation [1] | Number of industries in which occupation ranks in top 10 |
|---|---|
| Circulation clerk | 1 |
| Coil finisher | 1 |
| Coil winder | 3 |
| Commercial artist | 1 |
| Compression and/or injection molding machine operator, plastics | 1 |
| Computer operator | 2 |
| Computer programmer, business | 2 |
| Drafter | 4 |
| Drill press operator | 2 |
| Electrical and electronic assembler | 10 |
| Electrical and electronic technician | 10 |
| Electrician | 1 |
| Electro mechanical equipment assembler | 10 |
| Engineer, aeronautical | 2 |
| Engineer, electrical and electronic | 9 |
| Engineer, industrial | 5 |
| Engineer, mechanical | 2 |
| Engineering technician | 1 |
| Filer, grinder, buffer, chipper, cleaner, and/or polisher | 3 |
| General clerk | 13 |
| Grinding machine operator, metal | 2 |
| Helper, trades | 2 |
| Industrial truck operator | 4 |
| Inspector | 16 |
| Instrument maker and/or assembler | 3 |
| Keypunch operator | 1 |
| Lathe and/or turning machine operator, metal | 7 |
| Lens grinder | 1 |
| Letterpress operator, sheet, roll or web fed [2] | 1 |
| Machine assembler | 4 |
| Machine tool operator, combination | 3 |
| Machine tool setter, metal working | 3 |
| Machinist | 1 |

See footnotes at end of table.

Table 2 OCCUPATIONS RANKED IN THE TOP 10 IN EMPLOYMENT IN AT LEAST ONE HIGH-TECHNOLOGY INDUSTRY NEW YORK STATE, 1980–Continued

| Occupation ¹ | Number of industries in which occupation ranks in top 10 |
|---|---|
| Maintenance repairer, general utility | 2 |
| Mechanic, maintenance | 2 |
| Mixer and/or blender, chemicals and chemical products | 2 |
| | |
| Offset lithographic press operator, sheet, roll or web fed | 1 |
| Order filler | 1 |
| | |
| Physical science technician | 2 |
| Press assistant and feeder | 1 |
| Power brake and/or bending machine operator, metal | 1 |
| Production clerk and/or coordinator | 5 |
| Production packager, hand or machine | 9 |
| Punch press operator | 4 |
| Purchasing agent and/or buyer | 1 |
| | |
| Reporter and correspondent | 1 |
| | |
| Science technician | 2 |
| Secretary | 17 |
| Sewing machine operator, regular equipment, nongarment | 1 |
| Shipping packer | 1 |
| Shipping/receiving clerk | 2 |
| Stenographer | 2 |
| Stock clerk, stockroom, warehouse or storage yard | 2 |
| Stripper | 1 |
| Supervisor, nonworking | 17 |
| Systems analyst, business | 2 |
| Systems analyst, scientific and technical | 1 |
| | |
| Tester | 2 |
| Tinter | 1 |
| Tool and die maker | 3 |
| Truck driver | 2 |
| Typist | 1 |
| | |
| Unskilled assembler | 9 |
| | |
| Welder and flamecutter | 6 |
| Wirer, electronic | 9 |
| Writer and/or editor | 1 |

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Occupational titles are from the Occupational Employment Statistics (OES) classification system.

This title, though ranked in the top 10 of commercial printing (SIC 275) is not found in the specific high-technology industry, commercial lithographic printing (SIC 2752).

# Apprenticeship Occupations

MANY of the skilled craft occupations, some of the semiskilled and a few of the technician titles may be learned through apprenticeship programs.

Apprenticeship occupations that rank among the 10 largest occupations in one or more high-technology industries, with the industries and standard industrial classification (SIC) code(s) in which they are found, appear in Table 3 below.

Other apprenticeable occupations found in high-technology industries include the following:

- Etcher and/or engraver
- Plumber and/or pipefitter
- Millwright
- Carpenter
- Instrument repairer
- Stationary engineer
- Mechanic, refrigeration and/or air conditioning
- Sheetmetal worker
- Platemaker
- Mechanic, aircraft

In addition to the occupations discussed in this chapter, there may be other occupations in these industries that are or could be apprenticeable.

Table 3 APPRENTICESHIP OCCUPATIONS IN HIGH TECHNOLOGY INDUSTRIES

| Occupation | Industry | SIC code |
|---|---|---|
| Commercial artist | Periodicals | 272 |
| Compression and/or injection molding machine operator, plastics | Radio and TV receiving equipment | 365 |
| Drafter | Construction and related machinery | 353 |
| | Special industry machinery | 355 |
| | Electric distributing equipment | 361 |
| | Engineering and scientific instruments | 381 |
| Electrical and electronic technician | Office and computing machines | 357 |
| | Electric distributing equipment | 361 |
| | Radio and TV receiving equipment | 365 |
| | Communication equipment | 366 |
| | Electronic components and accessories | 367 |
| | Miscellaneous electrical equipment and supplies | 369 |
| | Guided missiles, space vehicles, parts | 376 |
| | Engineering and scientific instruments | 381 |
| | Measuring and controlling devices | 382 |
| | Computer and data processing services | 737 |
| Electrician | Motor vehicles and equipment | 371 |
| Grinding machine operator, metal | General industrial machinery | 356 |
| | Electric distributing equipment | 361 |
| | Electrical industrial apparatus | 362 |

See footnote at end of table.

Table 3 APPRENTICESHIP OCCUPATIONS IN HIGH TECHNOLOGY INDUSTRIES--Continued

| Occupation | Industry | SIC code |
|---|---|---|
| Inspector [1]--continued | Electrical lighting and wiring equipment | 364 |
| | Radio and TV receiving equipment | 365 |
| | Communication equipment | 366 |
| | Electronic components and accessories | 367 |
| | Miscellaneous electrical equipment and supplies | 369 |
| | Motor vehicles and equipment | 371 |
| | Aircraft and parts | 372 |
| | Guided missiles, space vehicles, parts | 376 |
| | Measuring and controlling devices | 382 |
| | Optical instruments and lenses | 383 |
| | Medical instruments and supplies | 384 |
| Instrument maker and/or assembler | Measuring and controlling devices | 382 |
| | Optical instruments and lenses | 383 |
| | Medical instruments and supplies | 384 |
| Lathe and/or turning machine operator, metal | Construction and related machinery | 353 |
| | Special industry machinery | 355 |
| | General industrial machinery | 356 |
| | Electrical industrial apparatus | 362 |
| | Electric lighting and wiring equipment | 364 |
| | Miscellaneous electrical equipment and supplies | 369 |
| Lens grinder | Optical instruments and lenses | 383 |
| Machinist | Special industry machinery | 355 |
| Maintenance repairer, general utility | Agricultural chemicals | 287 |
| | Miscellaneous chemical products | 289 |
| Mechanic, maintenance | Industrial inorganic chemicals | 281 |
| | Motor vehicles and equipment | 371 |
| Offset lithographic press operator, sheet, roll or web fed | Commercial printing | 275 |
| Press assistant and feeder | Commercial printing | 275 |
| Stripper | Commercial printing | 275 |
| Systems analyst, business | Computer and data processing services | 737 |
| Tool and die maker | Metal forgings and stampings | 346 |
| | Electric lighting and wiring equipment | 364 |
| | Motor vehicles and equipment | 371 |
| Welder and flamecutter | Metal forgings and stampings | 346 |
| | Construction and related machinery | 353 |
| | Special industry machinery | 355 |
| | General industrial machinery | 356 |
| | Motor vehicles and equipment | 371 |
| | Guided missiles, space vehicles, parts | 376 |

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[1] The apprenticeable inspector title in these industries is machine shop floor inspector.

# Assemblers

As indicated earlier in this report, assemblers, especially the semiskilled, but also the skilled and unskilled, represent a fairly large percentage of total employment in high-technology industries. Analysis of the 29 three-digit SIC industries that include the specific 52 four-digit high-technology industries reveals that over 9 percent of all employment is in the assembler occupations.

In 1980, there were over 22,000 semiskilled assemblers, roughly 21,000 unskilled assemblers, and about 12,000 skilled assemblers in the state. Furthermore, unskilled assemblers are among the top 10 largest occupations in nine of the three-digit high-technology industries, semiskilled assemblers in 14 (primarily electrical and electronic assemblers) and skilled assemblers in 12 (mainly electromechanical equipment assemblers).

Table 4 presents three-digit SIC industries in which the four-digit SIC high technology industries are found, and where estimates are available, employment and the Occupational Employment Statistics (OES) titles for the three assembler groups. ☐

## Table 4. EMPLOYMENT OF ASSEMBLERS IN HIGH TECHNOLOGY INDUSTRIES BY SKILL LEVEL AND INDUSTRY, NEW YORK STATE, 1980

| SIC code | Industry | Employment | Number of skilled assemblers | Occupation | Number of semi-skilled assemblers | Occupation | Number of unskilled assemblers | Occupation |
|---|---|---|---|---|---|---|---|---|
| | Total | 600,030 | [1] 11,890 | | [1] 22,200 | | [1] 20,820 | |
| 272 | Periodicals | 26,580 | - | - | - | - | - | - |
| 275 | Commercial printing | 38,700 | - | - | 870 | Bindery worker, assembly | - | - |
| 281 | Industrial inorganic chemicals | 8,080 | - | - | - | - | - | - |
| 283 | Drugs | 21,780 | - | - | - | - | - | - |
| 284 | Soap, cleaners, toilet goods | 18,560 | - | - | - | - | - | - |
| 286 | Industrial organic chemicals | 11,130 | - | - | - | - | - | - |
| 287 | Agricultural chemicals | 1,200 | - | - | - | - | - | - |
| 289 | Miscellaneous chemical products | 3,420 | - | - | - | - | - | - |
| 346 | Metal forgings and stampings | 14,620 | n.a. | Assembler | - | - | - | - |
| 353 | Construction and related machinery | 7,080 | 170 | Electro-mech. equip. assembler | 690 | Machine assembler, electrical & electronic assembler | 140 | Unskilled assemblers |

See footnote at end of table.

Table 4. EMPLOYMENT OF ASSEMBLERS IN HIGH-TECHNOLOGY INDUSTRIES BY SKILL LEVEL AND INDUSTRY, NEW YORK STATE, 1980 Continued

| SIC code | Industry | Employment | Number of skilled assemblers | Occupation | Number of semiskilled assemblers | Occupation | Number of unskilled assemblers | Occupation |
|---|---|---|---|---|---|---|---|---|
| 355 | Special industry machinery | 14,000 | 720 | Electro-mech. equip. assembler | 1,160 | Electrical and electronic assembler | 130 | Unskilled assemblers |
| 356 | General industrial machinery | 27,900 | n.a. | " | n.a. | Machine assembler, electrical & electronic assembler | n.a. | All other assemblers |
| 357 | Office and computing machines | 54,940 | 3,320 | " | 850 | Electrical and electronic assembler | 240 | Unskilled assemblers |
| 361 | Electric distributing equipment | 4,750 | n.a. | " | n.a. | Electrical and electronic assembler, machine assembler | - | - |
| 362 | Electrical industrial apparatus | 20,980 | 340 | " | 1,380 | " | 1,410 | Unskilled assemblers |
| 364 | Electric lighting and wiring equipment | 25,140 | 910 | " | 2,160 | Electrical and electronic assembler | 3,160 | " |
| 365 | Radio and TV receiving equipment | 8,700 | - | - | 560 | " | 410 | " |
| 366 | Communication equipment | 45,410 | 1,250 | Instrument maker and/or assembler, electro-mech. equip. assembler | 2,740 | Machine assembler, electrical & electronic assembler | 940 | Unskilled assemblers |
| 367 | Electronic components and accessories | 40,960 | - | - | 4,520 | Electrical and electronic assembler | 1,860 | " |

Table 4 EMPLOYMENT OF ASSEMBLERS IN HIGH TECHNOLOGY INDUSTRIES BY SKILL LEVEL AND INDUSTRY, NEW YORK STATE, 1980 Continued

| SIC code | Industry | Employment | Number of skilled assemblers | Occupation | Number of semi-skilled assemblers | Occupation | Number of unskilled assemblers | Occupation |
|---|---|---|---|---|---|---|---|---|
| 369 | Miscellaneous electrical equipment and supplies | 7,640 | n.a. | Clock/watch assembler, electro-mech. equip. assembler | n.a. | Electrical and electronic assembler, machine assembler | n.a. | All other assemblers |
| 371 | Motor vehicles and equipment | 31,670 | - | - | 80 | Machine assembler | 6,550 | Unskilled assemblers |
| 372 | Aircraft and parts | 31,150 | 140 | Electro-mech. equip. assembler | 2,380 | Aircraft structure and surface assembler, machine assembler, electrical & electronic assembler | 1,110 | " |
| 376 | Guided missiles, space vehicles, parts | 1,760 | - | - | n.a. | " | - | - |
| 381 | Engineering and scientific instruments | 11,250 | 240 | Electro-mech. equip. assembler | 290 | Electrical and electronic assembler | 140 | Unskilled assemblers |
| 382 | Measuring and controlling devices | 11,560 | 1,660 | Instrument maker and/or assembler, electro-mech. equip. assembler | 800 | Electrical and electronic assembler | - | - |
| 383 | Optical instruments and lenses | 2,870 | 70 | Instrument maker and/or assembler | 100 | " | - | - |
| 384 | Medical instruments and supplies | 13,820 | 850 | Instrument maker and/or assembler, electro-mech. equip. assembler | - | - | 1,650 | Unskilled assemblers |

Table 4. EMPLOYMENT OF ASSEMBLERS IN HIGH TECHNOLOGY INDUSTRIES BY SKILL LEVEL AND INDUSTRY, NEW YORK STATE, 1980–Continued

| SIC code | Industry | Employment | Number of skilled assemblers | Occupation | Number of semi-skilled assemblers | Occupation | Number of unskilled assemblers | Occupation |
|---|---|---|---|---|---|---|---|---|
| 386 | Photographic equipment and supplies | 75,880 | n.a. | Electro-mech. equip. assembler, instrument maker and/or assembler, clock/watch assembler | n.a. | Electrical and electronic assembler | n.a. | All other assemblers |
| 737 | Computer and data processing services | 18,500 | – | – | – | – | – | – |

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[1] Includes all high-technology industries, including those for which employment estimates did not meet an established standard of reliability and were not published.

- Zero.

n.a. Not available.

# Educational Requirements

A large segment of employment in high-technology industries is made up of workers in occupations where four-year or two-year degrees or other post secondary education is required or preferred.

The majority of these occupations are in the professional and technical category; however, many positions in the management, sales, and office clerical categories usually are filled by individuals with college degrees or other post-secondary training. For example, many employers prefer secretarial applicants with business school, junior, or community college training.

The training required or preferred for a number of occupations is illustrated below:

**Four-year degree**

Accountant and auditor
Biological scientist
Chemist
Commercial artist
Computer programmer, business
Computer programmer, scientific and technical
Contract administrator
Designer (industrial, etc.)
Engineer, aeronautical
Engineer, chemical
Engineer, electrical and electronic
Engineer, industrial
Engineer, mechanical
Lawyer (plus law school)
Librarian, professional
Market research analyst
Mathematician
Medical scientist
Personnel and labor relations specialist
Purchasing agent and/or buyer
Reporter and correspondent
Sales representative (technical sales)
Statistician
Systems analyst, business
Systems analyst, scientific and technical
Writer and/or editor

**Two-year degree**

Biological science technician
Cost estimator, engineering
Drafter
Electrical and electronic technician
Engineering technician
Physical science technician
Sales representative
Science technician
Tool programmer, numerical control

**Post-secondary**

Accounting clerk
Bookkeeper, hand
Computer operator
Production clerk and/or coordinator
Secretary
Stenographer

Educational preparation and training routes followed by employees in many occupations, or required or preferred by employers in selecting job applicants, vary widely. Many sales representatives, for example, may lack college training but possess other attributes such as familiarity with a particular product line, enthusiasm, energy, and persuasive abilities. Some engineering and science technicians may receive their initial training in the Armed Forces and a few may learn their skills on the job. Finally, though engineers usually are required to possess a bachelor's degree, some positions may require a graduate degree. The attempt, in this report, has been to show the primary educational and/or training routes; not the only ones that may be followed successfully.

### On-The-Job Training

Occupations which are usually learned on the job include a large majority of assemblers, inspectors, supervisors, machine operators, plant clerical workers, and service workers. Many skilled craft workers also follow this training route, although their on-the-job training is usually supplemented with classroom study as in the case of apprenticeship programs. Some positions generally associated with two-year, four-year, or graduate-level degrees may be learned on the job, especially in small firms. For example, purchasing agents are sometimes former clerical personnel who have lengthy experience and knowledge of a firm's products or services, suppliers, and operating processes.

### Education and Training Routes

Table 5 provides information on occupations in high technology industries. Occupational titles, typical education and training routes, General Educational Development (GED), and Specific Vocational Preparation (SVP) levels generally required of workers are shown.

The occupational titles used in this report are those used in the Occupational Employment Statistics (OES) program and are, in most instances, more generalized than the detailed occupational titles listed in the *Dictionary of Occupational Titles* (DOT), fourth edition, 1977. For example, one of the titles shown in Table 5, Engineer, aeronautical, relates to nine specific DOT titles. The typical educational and training routes, as well as the GED and SVP codes, are those associated with many of the specific DOT titles that fall under each indicated OES title. In many instances, more than one code number appears for the GED and SVP levels. This simply indicates that the associated DOT titles have varying ratings for these factors.

**Scale of Specific Vocational Preparation**

| Level | |
|---|---|
| 1 | Short demonstration only |
| 2 | Anything beyond short demonstration up to and including 30 days |
| 3 | Over 30 days up to and including 3 months |
| 4 | Over 3 months up to and including 6 months |
| 5 | Over 6 months up to and including 1 year |
| 6 | Over 1 year up to and including 2 years |
| 7 | Over 2 years up to and including 4 years |
| 8 | Over 4 years up to and including 10 years |
| 9 | Over 10 years |

SOURCE: U.S. Department of Labor, *Handbook for Analyzing Jobs*, May 1980.

Since educational and training routes followed vary widely, both *usual* and *possible* routes are indicated in Table 5.

### General Educational Development

General Educational Development is education of a general nature which contributes to reasoning development and the acquisition of mathematical and language skills that are required of the worker to achieve average successful job performance. This education, which does not have a recognized, specific occupational objective, can be obtained formally in elementary school, high school, or college, or informally through experience or independent study.[1]

General Educational Development is divided into six levels of sophistication with regard to:

1. reasoning development,
2. mathematical development, and
3. language development.

The sixth level of GED is the highest. A rough comparison between GED level and educational attainment can also be made, with level 3 signifying a high school education, level 4 an associate degree, level 5 a bachelor's degree and level 6 a master's degree.[2]

### Specific Vocational Preparation

Specific Vocational Preparation (SVP) represents the amount of time required to learn the techniques, acquire information, and develop the facility needed for average performance in a specific job-worker situation. The training may be acquired in a school, work, military, institution, or a vocational environment. It does not include orientation training required of even a fully qualified worker to become accustomed to the special conditions of any new job.[3]

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[1] *Handbook for Analyzing Jobs*, U.S. Department of Labor, May 1980.

[2] *Labor Market Information Handbook for Occupational Planners and Administrators in New York State*, New York State Department of Labor, September 1980.

[3] *Annual Planning Information for Manpower Planners, Fiscal Year 1983, New York State*, New York State Department of Labor, May 1982. □

Table 5. TYPICAL EDUCATION AND TRAINING ROUTES FOR OCCUPATIONS FOUND IN THE 10 LARGEST OCCUPATIONS OF AT LEAST ONE HIGH-TECHNOLOGY INDUSTRY

| Occupation | Education | | | | | Training | | SVP | GED |
|---|---|---|---|---|---|---|---|---|---|
| | High school | Post-secondary | 2-yr. college | 4-yr. college | Graduate degree | OJT | Apprentice/ months | Duration | Level |
| Accountant and auditor | | | | # | + | # | | 8 | 5 |
| Accounting clerk | + | # | + | | | # | | 5,4 | 3,4 |
| Aircraft structure and surface assembler | # | + | | | | # | | 6 | 4 |
| Assembler | + | | | | | # | | 2 | 2 |
| Bindery worker, assembly | + | | | | | # | | 4 | 2 |
| Biological science technician | | | # | # | | # | | 6 | 4 |
| Biological scientist | | | | + | # | # | | 8 | 6 |
| Bookbinder, machine | + | | | | | # | | 4 | 3 |
| Bookkeeper, hand | + | # | # | | | # | | 5 | 4 |
| Chemical operator A | # | | | | | # | | 7 | 3,4 |
| Chemical operator B | # | | | | | # | | 4 | 3 |
| Chemical operator helper | + | | | | | # | | 2 | 2 |
| Chemist | | | | + | # | # | | 8 | 6 |
| Chief operator | # | + | | | | # | | 7 | 4 |
| Circulation clerk | # | | | | | # | | 3 | 3 |
| Coil finisher | + | | | | | # | | 4 | 2 |
| Coil winder | # | + | | | | # | | 6 | 4 |
| Commercial artist | | + | + | # | + | # | 60 | 7 | 5 |
| Compression and/or injection molding machine operator, plastics | + | | | | | # | + 36 | 2,5 | 2,3 |
| Computer operator | + | # | + | | | # | | 6 | 4 |
| Computer programmer, business | | + | + | # | | # | | 7 | 5 |
| Drafter | | + | # | + | | # | + 48/60 | 7 | 5 |
| Drill press operator | + | | | | | # | | 2 | 2 |
| Electrical and electronic assembler | + | | | | | # | | 3,6 | 2,3 |
| Electrical and electronic technician | | # | # | + | | # | + 48 | 7 | 4,5 |

# Usual education/training route.
+ Possible education/training route.

Table 5. TYPICAL EDUCATION AND TRAINING ROUTES FOR OCCUPATIONS FOUND IN THE 10 LARGEST OCCUPATIONS OF AT LEAST ONE HIGH-TECHNOLOGY INDUSTRY--Continued

| Occupation | Education | | | | | Training | | SVP | GED |
|---|---|---|---|---|---|---|---|---|---|
| | High school | Post-secondary | 2-yr. college | 4-yr. college | Graduate degree | OJT | Apprentice/ months | Duration | Level |
| Electrician | # | + | + | | | + | # 48 | 7 | 4 |
| Electro-mechanical equipment assembler | # | + | | | | # | | 7 | 4 |
| Engineer, aeronautical | | | + | # | + | + | | 7,8 | 5,6 |
| Engineer, electrical and electronic | | | + | # | + | + | | 8 | 5 |
| Engineer, industrial | | | + | # | + | + | | 7,8 | 5,6 |
| Engineer, mechanical | | | + | # | + | + | | 8 | 5 |
| Engineering technician | | + | # | + | | # | | 5,7,8 | 4,5 |
| Filer, grinder, buffer, chipper, cleaner, and/or polisher | # | | | | | # | | 3,4 | 2,3 |
| General clerk | # | | | | | # | | 2 | 3 |
| Grinding machine operator, metal | + | # | | | | + | # 48 | 3,7 | 2,4 |
| Helper, trades | + | | | | | # | | 2 | 2 |
| Industrial truck operator | + | | | | | # | | 3 | 2 |
| Inspector | # | + | | | | # | + 48 | 2,7 | 2,3,4 |
| Instrument maker and/or assembler | # | + | | | | + | # 48 | 3,8 | 3,4 |
| Keypunch operator | + | # | + | | | # | | 3,4,5 | 3,4 |
| Lathe and/or turning machine operator, metal | # | + | + | | | # | + 48 | 6 | 4 |
| Lens grinder | # | + | + | | | + | # 48 | 5 | 4 |
| Letterpress operator, sheet, roll or web fed | # | + | + | | | + | # 60 | 7 | 4 |
| Machine assembler | # | | | | | # | | 6,7 | 3,4 |
| Machine tool operator, combination | # | + | + | | | # | | 3,6,7 | 2,4 |

# Usual education/training route.
+ Possible education/training route.

Table 5. TYPICAL EDUCATION AND TRAINING ROUTES FOR OCCUPATIONS FOUND IN THE 10 LARGEST OCCUPATIONS OF AT LEAST ONE HIGH-TECHNOLOGY INDUSTRY--Continued

| Occupation | Education | | | | | Training | | SVP | GED |
|---|---|---|---|---|---|---|---|---|---|
| | High school | Post-secondary | 2-yr. college | 4-yr. college | Graduate degree | OJT | Apprentice/ months | Duration | Level |
| Machine tool setter, metal working | * | + | + | | | * | | 6,7 | 4,5 |
| Machinist | * | * | + | | | + | * 48 | 7 | 4 |
| Maintenance repairer, general utility | * | + | | | | * | + 36/48 | 7 | 4 |
| Mechanic, maintenance | + | * | + | | | * | + 48 | 7 | 4 |
| Mixer and/or blender, chemicals and chemical products | + | | | | | * | | 4 | 3 |
| Offset lithographic press operator, sheet, roll or web fed | * | + | | | | + | * 48 | 7 | 4 |
| Order filler | * | | | | | * | | 3 | 3 |
| Physical science technician | + | * | * | + | | * | + 48 | 7 | 5 |
| Press assistant and feeder | * | + | | | | * | + 36 | 6 | 3 |
| Power brake and/or bending machine operator, metal | + | | | | | * | | 3 | 2 |
| Production clerk and/or coordinator | + | * | + | | | * | | 6 | 4 |
| Production packager, hand or machine | + | | | | | * | | 2 | 2 |
| Punch press operator | + | | | | | * | | 5 | 3 |
| Purchasing agent and/or buyer | | | + | * | + | * | | 7 | 4 |
| Reporter and correspondent | + | + | + | * | | * | | 7 | 5 |
| Science technician | + | + | * | * | | * | | 6 | 5 |
| Secretary | + | * | + | | | * | | 6 | 4 |
| Sewing machine operator, regular equipment, nongarment | + | | | | | * | | 4 | 3 |
| Shipping packer | + | | | | | * | | 3 | 3 |
| Shipping/receiving clerk | * | + | | | | * | | 5 | 3 |
| Stenographer | * | + | | | | * | | 5 | 3 |

* Usual education/training route.
+ Possible education/training route.

Table 5. TYPICAL EDUCATION AND TRAINING ROUTES FOR OCCUPATIONS FOUND IN THE 10 LARGEST OCCUPATIONS OF AT LEAST ONE HIGH TECHNOLOGY INDUSTRY—Continued

| Occupation | Education | | | | | Training | | SVP | GED |
|---|---|---|---|---|---|---|---|---|---|
| | High school | Post-secondary | 2-yr. college | 4-yr. college | Graduate degree | OJT | Apprentice/ months | Duration | Level |
| Stock clerk, stockroom, warehouse or storage yard | + | # | + | | | # | | 6 | 4 |
| Stripper | # | + | + | | | + | # 60 | 8 | 4 |
| Supervisor, nonworking | # | + | + | | | # | | 6,8 | 4 |
| Systems analyst, business | | | + | # | + | # | + 30 | 7 | 5 |
| Systems analyst, scientific and technical | | | + | # | # | # | | 7 | 6 |
| Tester | # | | | | | # | | 6 | 3 |
| Tinter | + | | | | | # | | 5,6 | 3 |
| Tool and die maker | # | # | | | | + | # 48 | 7 | 4 |
| Truck driver | # | | | | | # | | 4 | 3 |
| Typist | # | + | | | | # | | 3 | 3 |
| Unskilled assembler | + | | | | | # | | 2 | 2 |
| Welder and flamecutter | # | + | | | | + | # 48 | 6 | 4 |
| Wirer, electronic | + | | | | | # | | 3 | 2 |
| Writer and/or editor | + | + | + | # | + | # | | 8 | 6 |

# Usual education/training route.
+ Possible education/training route.

# Outlook for Occupations in High-Technology Industries

HIGH-TECHNOLOGY industries employ large numbers of professional and technical workers and also need highly skilled craft workers and productive operatives and semiskilled workers. What, however, is the projected demand for these and the other categories of workers such as the clerical, sales, and management groups?

The New York State Department of Labor projects a strong demand for professional and technical workers, especially electrical and electronic engineers, computer scientists, computer programmers, systems analysts, and industrial, mechanical and electronic technicians. *Occupational Projections, New York State, 1974-1985*, published by the state Labor Department, illustrates this assessment. While anticipating a rise of 4.9 percent in total employment in the state between 1974 and 1985, the department projects a rate of growth of 8.6 percent for the professional, technical and kindred worker category. Total employment of electrical engineers is expected to be up by 11 percent and mechanical engineers 9.2 percent. Very little change (1.1 percent growth) is expected in the number of industrial engineers, although this particular projection would no doubt change should an influx of high-technology industries take place or if an unanticipated large expansion of existing firms were to occur.

Similarly, the department predicts an overall growth of 17.6 percent in total employment of engineering and science technicians, 15.0 percent for electrical and electronic technicians, 12.7 percent for industrial technicians, and 22.4 percent for mechanical engineering technicians. Employment of computer programmers is expected to grow by 21.9 percent and computer systems analysts by 37.0 percent.

In the clerical worker category, a 20.5 percent increase in secretaries and a 14.0 percent rise in the number of computer and peripheral equipment operators is expected. Interestingly, the office machine operators category, overall, is expected to decline by about 8.8 percent.

Growth is expected in the number of skilled craft workers that will be needed, especially machine set-up and maintenance workers, but also operators of sophisticated new machinery. Labor Department projections anticipate growth of about 12.6 percent in the employment level of metal job and die setters and moderate growth of about 4.3 percent for tool and diemakers, and apprentices. Machinists and apprentices are expected to experience a decline of about 6 percent, although assessments of the supply and demand situation for this occupation have been very controversial in recent years. A forecast of a 10.6 percent rise in the employment of numerical control tool programmers, one of the occupations in the technician category, may imply a similar increase in semiskilled numerical control machine tool operators. It is expected that operators involved with such machinery will be in demand even though the need for unskilled and semiskilled production workers should decline sharply. The Labor Department projects a decline for virtually all of the operative categories, with increases expected only among welders and flamecutters, checkers, examiners, inspectors, and assemblers.

Employment of managers, officials, and proprietors, except farm, is expected to expand by 4.1 percent and that of sales representatives, and sales workers, not elsewhere classified, by about 3.8 percent. □

# Occupational Supply and Demand

AN assessment of labor supply and demand requires accurate data on job applicants, job openings, completers of vocational educational programs, recent degree recipients from higher education institutions, as well as information on current employment levels and job openings projections.

This section of the report uses statistics derived from the Job Service and Training Division and the Research and Statistics Division of the New York State Department of Labor. Despite their scope and detail, these statistics do *not* provide a comprehensive view of all labor market transactions. They do, however, provide valuable insights into existing and anticipated labor supply and demand for occupational categories and for specific occupations relevant to high-technology industries in the state.

New York State has a large and diverse supply of workers qualified for jobs within high-technology industries. Additionally, the state's universities, community colleges, BOCES network, and other public and private secondary and post-secondary educational institutions have excellent facilities and programs that provide training for substantial numbers of students in virtually all of the relevant occupational categories. Although some employers, educators and others believe they have observed isolated shortages of workers in certain occupations and predict future problems if corrective steps are not taken, the current and potential supply of workers seems adequate to meet the demand in most occupations.

### Professional and Technical Occupations

As indicated previously in this report, many professional and technical occupations in high-technology industries have significant levels of employment and strong current and/or projected demand. Job openings for electrical and electronic engineers in the state, for example, are expected to average over 2,550 each year through 1985. In addition, over 6,400 openings per year, during the same period, are expected for other technical engineers, including industrial, mechanical and chemical (see Table 6).

In recent years, about 68,000 engineering students annually have received bachelor's degrees in the nation. New York's colleges and universities have conferred about 7,200 engineering degrees (about 5,800 at the bachelor's level) annually in recent years. Job openings have been projected at 120,000 to 136,000 annually through 1990 nationwide. According to national data, virtually all recent graduates in this field have been able to find jobs.

New York State Job Service statistics on applicant registrations and job openings received for engineers for fiscal year 1982 (October 1, 1981 to September 30, 1982) show a different situation (see Table 7). They indicated 525 electrical and electronic engineers registered for jobs while 78 job openings were received statewide. Mechanical engineering applicants numbered 640 with 70 openings listed. There were 257 industrial engineers registered and 31 job openings received. Chemical engineers registered totaled 224 with 20 job openings listed. The apparent oversupply of applicants and the limited number of openings shown in these statistics reflect several factors. Poor economic conditions prevailed in New York State (and most of the nation) during the period. These conditions help to explain some of the differences between the projected openings data referred to in the previous section of this report and the actual openings received by the Job Service.

A second factor involves the special nature of the Job Service and Training Division. Data collected do not represent all labor market transactions for an occupation or occupational category. The Job Service registers a higher percentage of available job applicants and receives a higher percentage of job openings in some occupations and categories than in others. Generally, the Job Service receives a smaller share of job openings for professional and technical personnel than for clerical workers or semiskilled workers. Employers of engineers do much of their recruiting through professional engineering organizations, engineering schools, and direct advertising. Consequently, while the Job Service data are useful for assessing current trends, the reader is cautioned to recognize their limitations. Finally, the state Labor Department's projections assumed a gradual growth in the economy from the high unemployment levels of the mid-1970's and therefore do not reflect cyclical fluctuations in the economy. Annual average openings, in this method, remain constant and should not be expected to reflect actual openings.

The demand for computer specialists (including computer programmers and systems analysts) is strong and expected to remain so, both nationally and in the state. In this field, job openings in New York State through 1985 are expected to average over 5,000 per year. Education and training requirements vary greatly, making an assessment of the adequacy of supply based on degree recipients difficult. Nevertheless, those major fields of study from which employers often choose candidates for employment in computer occupations have witnessed increased enrollments and degrees conferred in recent years. For example, the number of individuals receiving bachelor's degrees in computer and information sciences, rose from 1,028 in 1979 to 1,728 by 1981 in New York State. Additionally, job openings in high-technology computer occupations are likely to be more plentiful for those with supplemental engineering, math and science backgrounds. In fact, business programmers may experience strong competition. Unmet demand, where it has occurred, has been for high-level developmental personnel, not for programmers performing relatively common business applications.

Job Service local offices registered 1,025 business programmers and received openings for 87 in fiscal year 1982. There were 155 engineering and scientific programmers available and 22 job openings received. There were 472 electronic data processing systems analysts registered with 63 openings listed.

Table 6. PROJECTED AVERAGE ANNUAL OPENINGS FOR SELECTED HIGH-TECHNOLOGY OCCUPATIONS, NEW YORK STATE 1974-1985

| Occupation | Average annual openings |
|---|---|
| Professional and technical | |
| Engineers, technical | 8,965 |
| Engineer, civil | 1,258 |
| Engineer, electrical | 2,554 |
| Engineer, industrial | 1,186 |
| Engineer, mechanical | 1,239 |
| Engineer, other | 2,728 |
| Computer specialist | 5,267 |
| Engineering and science technician | 9,056 |
| Engineering and science technician | 5,975 |
| Drafter | 3,081 |
| Clerical | |
| Secretary (other than legal, medical) | 44,515 |
| Typist | 16,458 |
| Miscellaneous clerical worker | 42,392 |
| Skilled | |
| Machinist and apprentice | 2,129 |
| Other metal craft workers | 1,528 |
| Other mechanics and repairers | 4,532 |
| Semiskilled | |
| Welder and flamecutter | 1,888 |
| Assembler | 7,401 |

Projected openings for engineering and science technicians, except drafters, are expected to average nearly 6,000 per year through 1985. This category includes electrical and electronic technicians, industrial engineering, and mechanical engineering technicians, among others — all of these are in demand in high-technology industries. A large increase in openings is also expected for drafters, with job openings per year averaging more than 3,000. Both New York State Job Service data and a report entitled *Supply/Demand Data for Occupational Education Planning in New York State, 1982*, published by the New York State Education Department, provide useful information on these technical occupations.

Job openings listed with the Job Service in fiscal year 1982 for electrical and electronic technicians totaled 216 while 1,403 job applicants registered for jobs. Openings for mechanical drafters, during the same period, num-

Table 7. APPLICANTS AND JOB OPENINGS RECEIVED FOR SELECTED HIGH TECHNOLOGY OCCUPATIONS, NEW YORK STATE JOB SERVICE FISCAL YEAR 1982
(October 1, 1981 - September 30, 1982)

| Occupation | Applicants registered | Openings received |
|---|---|---|
| Professional and technical | | |
| Engineer, electrical and electronic | 525 | 78 |
| Engineer, mechanical | 640 | 70 |
| Engineer, industrial | 257 | 31 |
| Engineer, chemical | 224 | 20 |
| Computer programmer, business | 1,025 | 87 |
| Computer programmer, engineering and scientific | 155 | 22 |
| Systems analyst, electronic data processing | 472 | 63 |
| Electrical and electronic technician | 1,403 | 216 |
| Industrial engineering technician | 76 | 12 |
| Mechanical engineering technician | 343 | 38 |
| Mechanical drafter | 851 | 137 |
| Clerical | | |
| Secretary | 13,905 | 3,179 |
| General clerk | 39,435 | 13,781 |
| Clerk typist | 19,103 | 4,278 |
| Skilled | | |
| Machinist | 2,000 | 321 |
| Maintenance mechanic | 1,643 | 290 |
| Machine set up operator and metal job-setter | 764 | 90 |
| Semiskilled | | |
| Welder and flamecutter | 4,200 | 532 |
| Electronics assembler | 3,850 | 1,113 |

bered about 140 while about 850 applicants were available. Openings for industrial engineering technicians numbered only 12 with 76 applicants registered. Job openings received for mechanical engineering technicians totaled 38 while 343 applicants registered.

The *Supply/Demand* report also compares completers of vocational education programs in the state with Job Service applicants available and job openings projections published by the state Labor Department. Program completers data are for the school year ending in June 1980 while data for Job Service applicants available are for fiscal year 1981 (October 1, 1980 to September 30, 1981). The statewide data for completers of combined technical education programs and job applicants reveal that about 11,300 individuals were available to fill the approximately 9,400 job openings projected for this period. There may be some duplication in the count of completers and applicants because some June 1980 graduates may be included in fiscal year 1981 data for Job Service applicants registered.

In terms of specific programs within technical education, completers of electrical technology programs numbered about 720 with 260 openings forecast. Electronic technology supply totaled 4,466 with approximately 1,800 openings. Industrial, instrumentation, and mechanical technology supply totals were less than the projected available openings, suggesting a more favorable supply/demand relationship in these fields. There were 545 industrial technology program completers and applicants registered compared with a projected 854 openings. The supply of instrumentation technology-related completers and applicants was 58 with 167 openings projected. Completers and applicants of mechanical technology programs totaled 1,186 with a projected 1,195 openings.

**Clerical Occupations**

Projected average annual openings through 1985 for clerical occupations include: secretary - over 44,500; typist - about 16,500; miscellaneous clerical workers - about 42,000.

In fiscal year 1982, the Job Service listed almost 3,200 openings statewide for secretaries while nearly 14,000 secretarial applicants registered for employment. General clerk openings totaled about 14,000 with about 40,000 registered applicants. Almost 20,000 clerk-typists were available for referral to about 4,300 job openings.

**Skilled Occupations**

Annual openings for machinists and machinist apprentices are expected to average over 2,100 per year through 1985. Openings for mechanics and repairers, a group that includes maintenance mechanic, are expected to average over 4,500 during the same period. Openings for other metal craft workers are expected to average about 1,500 annually.

Job Service statistics indicate many skilled craft workers, notably machinists, maintenance workers, and metal job setters, were in abundant supply during fiscal year 1982. Nearly 2,000 machinists were available at Job Service offices for the 321 job openings listed. About 290 job openings were listed for the 1,643 maintenance mechanics registered, while 764 metal job setters and machine set-up operators registered for 90 openings.

**Semiskilled Occupations**

Average annual openings for all welders and flame cutters are expected to total about 1,900, while those for all assemblers should amount to over 7,400.

Large numbers of applicants were available at Job Service local offices statewide during fiscal year 1982 for two of the important semiskilled occupations found in high-technology industries. There were over 4,200 welders (combination and arc) registered, while over 3,850 electronics assemblers were available. Openings listed for welders and electronics assemblers totaled 532 and 1,113, respectively.

**Supply and Demand**

Despite the large supply of applicants available in most occupations (and possible oversupply in some), the Job Service's operational statistics for fiscal year 1982 tend, in some cases, to support the idea that skills of workers do not match employers' demands. The applicants and openings data for electrical and electronic engineers are one example. With 525 applicants available in these titles, only 78 openings were received statewide by local Job Service offices in fiscal year 1982. Only 10 openings were filled and 88 openings had been unfilled for over 30 days at the end of the period (some openings were carryover from the previous year). Though several possible explanations may be pertinent, it is evident that qualifications of many applicants simply did not match the employers' hiring specifications.

The data for business programmers also serves to illustrate the above problem. With 1,025 registered applicants, only 87 openings were listed, of which 28 were filled. At the end of the year, 27 openings had been listed for over 30 days.

In contrast, of the 3,179 job openings received by the Job Service for secretaries, 1,288 were filled and 521 had remained open for more than 30 days at the end of the period. Of the nearly 14,000 job openings received for general office clerks, 12,163 had been filled and only 255 remained open.

The difficulties that exist in matching workers' skills and employers' hiring specifications may increase with changing technologies and products. It emphasizes the need to retrain some experienced workers and to modify educational curricula for those still in school to enhance their employability.

To summarize, the state's current supply of qualified workers is large and its capacity to educate and train students for future job openings in high-technology industries is strong. Available statistical data suggest few, if any, current supply shortages; current economic conditions may, in fact, be responsible for an oversupply of workers in many occupations. High-technology firms that are now located in the state, as well as those that may be considering coming to New York, should find favorable labor supply conditions. On the other hand, qualified workers, in most categories, should experience increased demand for their services from high-technology firms. Although some retraining of experienced workers and modifications of educational curricula may be necessary because of the introduction of new technologies, New York State's overall labor resources are fundamentally sound and should be able to meet the forseeable needs of high-technology industries. ☐

# Appendix Tables

Appendix tables 1-28 show the 10 occupations with the largest employment in 28 of the 29 three-digit industries that include the 52 four-digit high-technology industries. Insufficient data were available for the 29th industry, photographic equipment and supplies (SIC 386).

The tables provide employment and the percent of total employment by occupation for each industry, except for those in which the employment estimates did not meet an established standard of statistical reliability and were not published. In a number of tables, there may be a different percent of total employment for occupations which appear to have the same employment. This has occurred because the percent of total employment is based on unrounded data.

In the tables, the term n.e.c. (not elsewhere classified) is used to group industries not classified in other 4-digit codes that fall within the 3-digit classification.

### Table 1. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN PERIODICALS (SIC 272) [1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in periodicals | 26,580 | 100.00 |
| 1 | Writer and/or editor | 3,840 | 14.44 |
| 2 | Secretary | 2,910 | 10.94 |
| 3 | General clerk | 2,020 | 7.62 |
| 4 | Typist | 870 | 3.27 |
| 5 | Reporter and correspondent | 750 | 2.82 |
| 6 | Commercial artist | 530 | 2.00 |
| 7 | Bookkeeper, hand | 500 | 1.86 |
| 8 | Circulation clerk | 400 | 1.52 |
| 9 | Accounting clerk | 330 | 1.23 |
| 10 | Stenographer | 290 | 1.09 |

[1] This industry includes high-technology industry periodicals (SIC 2721).
SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 2. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN COMMERCIAL PRINTING (SIC 275) [1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in commercial printing | 38,700 | 100.00 |
| 1 | Offset lithographic press operator, sheet, roll or web fed | 5,420 | 14.01 |
| 2 | Press assistant and feeder | 1,830 | 4.73 |
| 3 | Letter press operator, sheet, roll or web fed | 1,740 | 4.50 |
| 4 | Stripper | 1,240 | 3.20 |
| 5 | Shipping and/or receiving clerk | 1,030 | 2.66 |
| 6 | Bookkeeper, hand | 1,000 | 2.58 |
| 7 | Bookbinder, machine | 990 | 2.55 |
| 8 | General clerk | 890 | 2.30 |
| 9 | Bindery worker, assembly | 870 | 2.24 |
| 10 | Secretary | 800 | 2.07 |

[1] This industry includes high-technology industry commercial lithographic printing (SIC 2752).
SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 3. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN INDUSTRIAL INORGANIC CHEMICALS (SIC 281) [1]
1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in industrial inorganic chemicals | 8,080 | 100.00 |
| 1 | Chemical operator B | 550 | 6.82 |
| 2 | Secretary | 530 | 6.56 |
| 3 | General clerk | 370 | 4.53 |
| 4 | Engineering technicians | 350 | 4.39 |
| 5 | Chemical operator helper | 310 | 3.80 |
| 6 | Mechanic, maintenance | 280 | 3.48 |
| 7 | Supervisor, nonworking | 270 | 3.33 |
| 8 | Chemist | 250 | 3.09 |
| 9 | Chemical operator A | 240 | 2.97 |
| 10 | Science technicians | 160 | 1.98 |

[1] This industry includes high-technology industry industrial inorganic chemicals, n.e.c. (SIC 2819).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 4. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN DRUGS (SIC 283) [1]
1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in drugs | 21,780 | 100.00 |
| 1 | Production packager, hand or machine | 2,090 | 9.58 |
| 2 | Secretary | 1,270 | 5.81 |
| 3 | Chemist | 1,160 | 5.32 |
| 4 | Supervisor, nonworking | 630 | 2.87 |
| 5 | Biological science technician | 610 | 2.79 |
| 6 | Biological scientist | 570 | 2.60 |
| 7 | Chemical operator A | 500 | 2.30 |
| 8 | General clerk | 500 | 2.29 |
| 9 | Accountant and auditor | 410 | 1.90 |
| 10 | Physical science technician | 350 | 1.62 |

[1] This industry includes high-technology industries biological products (SIC 2831) and medicinals and botanicals (SIC 2833).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 5. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN SOAP, CLEANERS, AND TOILET GOODS (SIC 284) [1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in soap, cleaners, and toilet goods | 18,560 | 100.00 |
| 1 | Production packager, hand or machine | 2,400 | 12.93 |
| 2 | Secretary | 1,870 | 10.10 |
| 3 | General clerk | 990 | 5.31 |
| 4 | Accountant and auditor | 590 | 3.19 |
| 5 | Accounting clerk | 490 | 2.62 |
| 6 | Mixer and/or blender, chemicals and chemical products | 350 | 1.88 |
| 7 | Industrial truck operator | 290 | 1.55 |
| 8 | Chemist | 270 | 1.44 |
| 9 | Science technicians | 270 | 1.43 |
| 10 | Systems analyst, business | 260 | 1.39 |

[1] This industry includes high-technology industry toilet preparations (SIC 2844).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 6. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN INDUSTRIAL ORGANIC CHEMICALS (SIC 286) [1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| 1 | Chemical operator A | n.p. | n.p. |
| 2 | Supervisor, nonworking | n.p. | n.p. |
| 3 | Order filler | n.p. | n.p. |
| 4 | Secretary | n.p. | n.p. |
| 5 | Chemical operator B | n.p. | n.p. |
| 6 | Chemist | n.p. | n.p. |
| 7 | Accounting clerk | n.p. | n.p. |
| 8 | Chief operator | n.p. | n.p. |
| 9 | Mixer and/or blender, chemicals and chemical products | n.p. | n.p. |
| 10 | Physical science technician | n.p. | n.p. |

[1] This industry includes high-technology industry industrial organic chemicals, n.e.c. (SIC 2869).

n.p. Not publishable.

SOURCE: New York State Department of Labor, Division of Research and Statistics, Occupational Employment Statistics, manufacturing survey data, April-June 1980, unpublished.

### Table 7. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN AGRICULTURAL CHEMICALS (SIC 287) [1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| 1 | Truck driver | n.p. | n.p. |
| 2 | Maintenance repairer, general utility | n.p. | n.p. |
| 3 | Supervisor, nonworking | n.p. | n.p. |
| 4 | Chemical operator A | n.p. | n.p. |
| 5 | Chief operator | n.p. | n.p. |
| 6 | Industrial truck operator | n.p. | n.p. |
| 7 | Production packager, hand or machine | n.p. | n.p. |
| 8 | Stock clerk, stockroom, warehouse or storage yard | n.p. | n.p. |
| 9 | Shipping/receiving clerk | n.p. | n.p. |
| 10 | General clerk | n.p. | n.p. |

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[1] This industry includes high-technology industry agricultural chemicals, n.e.c. (SIC 2879).

n.p. Not publishable.

SOURCE: New York State Department of Labor, Division of Research and Statistics, Occupational Employment Statistics, manufacturing survey data, April-June 1980, unpublished.

### Table 8. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN MISCELLANEOUS CHEMICAL PRODUCTS (SIC 289) [1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| 1 | Production packager, hand or machine | n.p. | n.p. |
| 2 | Mixer and/or blender, chemicals and chemical products | n.p. | n.p. |
| 3 | Secretary | n.p. | n.p. |
| 4 | Supervisor, nonworking | n.p. | n.p. |
| 5 | Industrial truck operator | n.p. | n.p. |
| 6 | Maintenance repairer, general utility | n.p. | n.p. |
| 7 | Tinter | n.p. | n.p. |
| 8 | General clerk | n.p. | n.p. |
| 9 | Truck driver | n.p. | n.p. |
| 10 | Chemist | n.p. | n.p. |

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[1] This industry includes high-technology industry adhesives and sealants (SIC 2891).

n.p. Not publishable.

SOURCE: New York State Department of Labor, Division of Research and Statistics, Occupational Employment Statistics, manufacturing survey data, April-June 1980, unpublished.

### Table 9. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN METAL FORGINGS AND STAMPINGS (SIC 346) [1]
1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| 1 | Punch press operator, metal | n.p. | n.p. |
| 2 | Assembler | n.p. | n.p. |
| 3 | Tool and die maker | n.p. | n.p. |
| 4 | Welder and flamecutter | n.p. | n.p. |
| 5 | Filer, grinder, buffer, chipper, cleaner and/or polisher | n.p. | n.p. |
| 6 | Supervisor, nonworking | n.p. | n.p. |
| 7 | Helper, trades | n.p. | n.p. |
| 8 | Power brake and/or bending machine operator, metal | n.p. | n.p. |
| 9 | Production packager, hand or machine | n.p. | n.p. |
| 10 | Inspector | n.p. | n.p. |

[1] This industry includes high technology industries automotive stampings (SIC 3465) and crowns and closures (SIC 3466).

n.p. Not publishable.

SOURCE: New York State Department of Labor, Division of Research and Statistics, Occupational Employment Statistics, manufacturing survey data, April-June 1980, unpublished.

### Table 10. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN CONSTRUCTION AND RELATED MACHINERY (SIC 353) [1]
1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
|  | Total - all occupations in construction and related machinery | 7,080 | 100.00 |
| 1 | Welder and flamecutter | 570 | 8.08 |
| 2 | Machine assembler | 510 | 7.20 |
| 3 | Supervisor, nonworking | 280 | 3.98 |
| 4 | Lathe and/or turning machine operator, metal | 260 | 3.66 |
| 5 | Stock clerk, stockroom, warehouse, or storage yard | 240 | 3.37 |
| 6 | General clerk | 200 | 2.84 |
| 7 | Production clerk and/or coordinator | 190 | 2.61 |
| 8 | Electrical and electronic assembler | 180 | 2.53 |
| 9 | Unskilled assemblers | 140 | 1.98 |
| 10 | Drafter | 130 | 1.78 |

[1] This industry includes high-technology industries construction machinery (SIC 3531) and mining machinery (SIC 3532)

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 11. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN SPECIAL INDUSTRY MACHINERY (SIC 355) [1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in special industry machinery | 14,000 | 100.00 |
| 1 | Machine assembler | 1,050 | 7.48 |
| 2 | Electro-mechanical equipment assembler | 720 | 5.12 |
| 3 | General clerk | 480 | 3.42 |
| 4 | Lathe and/or turning machine operator, metal | 480 | 3.40 |
| 5 | Supervisor, nonworking | 440 | 3.17 |
| 6 | Engineer, mechanical | 410 | 2.89 |
| 7 | Welder and flamecutter | 400 | 2.86 |
| 8 | Drafter | 380 | 2.74 |
| 9 | Machinist | 370 | 2.66 |
| 10 | Machine tool operator, combination | 340 | 2.46 |

[1] This industry includes high-technology industries food products machinery (SIC 3551) and special industry machinery, n.e.c. (SIC 3559).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 12. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN GENERAL INDUSTRIAL MACHINERY (SIC 356) [1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| 1 | Lathe and/or turning machine operator, metal | n.p. | n.p. |
| 2 | Supervisor, nonworking | n.p. | n.p. |
| 3 | Grinding machine operator, metal | n.p. | n.p. |
| 4 | Machine tool operator, combination | n.p. | n.p. |
| 5 | Inspector | n.p. | n.p. |
| 6 | Drill press operator | n.p. | n.p. |
| 7 | Machine assembler | n.p. | n.p. |
| 8 | Electro-mechanical equipment assembler | n.p. | n.p. |
| 9 | Helper, trades | n.p. | n.p. |
| 10 | Welder and flamecutter | n.p. | n.p. |

[1] This industry includes high-technology industry general industrial machinery, n.e.c. (SIC 3569).

n.p. Not publishable.

SOURCE: New York State Department of Labor, Division of Research and Statistics, Occupational Employment Statistics, manufacturing survey data, April-June 1980, unpublished.

### Table 13. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN OFFICE AND COMPUTING MACHINES (SIC 357) [1]

1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in office and computing machines | 54,940 | 100.00 |
| 1 | Computer programmer, business | 4,160 | 7.58 |
| 2 | Electro-mechanical equipment assembler | 3,230 | 5.88 |
| 3 | Secretary | 2,790 | 5.08 |
| 4 | Electrical and electronic technician | 2,440 | 4.44 |
| 5 | General clerk | 2,430 | 4.42 |
| 6 | Engineer, industrial | 1,990 | 3.62 |
| 7 | Accountant and auditor | 1,560 | 2.84 |
| 8 | Production clerk and/or coordinator | 930 | 1.69 |
| 9 | Inspector | 920 | 1.67 |
| 10 | Computer operator | 910 | 1.65 |

[1] This industry includes high-technology industries electronic computing equipment (SIC 3573), scales and balances, except laboratory (SIC 3576), and office machines, n.e.c. (SIC 3579).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 14. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN ELECTRIC DISTRIBUTING EQUIPMENT (SIC 361) [1]

1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| 1 | Electro-mechanical equipment assembler | n.p. | n.p. |
| 2 | Wirer, electronic | n.p. | n.p. |
| 3 | Coil winder | n.p. | n.p. |
| 4 | Electrical and electronic engineer | n.p. | n.p. |
| 5 | Supervisor, nonworking | n.p. | n.p. |
| 6 | Tester | n.p. | n.p. |
| 7 | Electrical and electronic technician | n.p. | n.p. |
| 8 | Coil finisher | n.p. | n.p. |
| 9 | Drafter | n.p. | n.p. |
| 10 | Inspector | n.p. | n.p. |

[1] This industry includes high-technology industry switchgear and switchboard apparatus (SIC 3613).

n.p. Not publishable.

SOURCE: New York State Department of Labor, Division of Research and Statistics, Occupational Employment Statistics, manufacturing survey data, April-June 1980, unpublished.

### Table 15 THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN ELECTRICAL INDUSTRIAL APPARATUS (SIC 362)[1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total all occupations in electrical industrial apparatus | 20,980 | 100.00 |
| 1 | Unskilled assemblers | 1,410 | 6.73 |
| 2 | Supervisor, nonworking | 900 | 4.29 |
| 3 | Electrical and electronic assembler | 720 | 3.42 |
| 4 | Inspector | 670 | 3.18 |
| 5 | Machine assembler | 660 | 3.15 |
| 6 | Coil winder | 500 | 2.40 |
| 7 | Wirer, electronic | 490 | 2.33 |
| 8 | Engineer, electrical and electronic | 440 | 2.09 |
| 9 | Lathe and/or turning machine operator, metal | 440 | 2.08 |
| 10 | Electro-mechanical equipment assembler | 340 | 1.62 |

[1] This industry includes high-technology industries industrial controls (SIC 3622) and welding apparatus, electric (SIC 3623).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 16 THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN ELECTRIC LIGHTING AND WIRING EQUIPMENT (SIC 364)[1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total all occupations in electric lighting and wiring equipment | 25,140 | 100.0 |
| 1 | Unskilled assembler | 3,160 | 12.56 |
| 2 | Electrical and electronic assembler | 2,160 | 8.60 |
| 3 | Electro-mechanical equipment assembler | 910 | 3.62 |
| 4 | Lathe and/or turning machine operator, metal | 730 | 2.90 |
| 5 | Punch press operator, metal | 730 | 2.89 |
| 6 | Wirer, electronic | 690 | 2.76 |
| 7 | Production packager, hand or machine | 670 | 2.66 |
| 8 | Supervisor, nonworking | 570 | 2.25 |
| 9 | Tool and die maker | 490 | 1.95 |
| 10 | Inspector | 430 | 1.71 |

[1] This industry includes high-technology industries electric lamps (SIC 3641), current-carrying wiring devices (SIC 3643), noncurrent carrying wiring devices (SIC 3644), residential lighting fixtures (SIC 3645), and vehicular lighting equipment (SIC 3647).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

Table 17. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN RADIO AND TV RECEIVING EQUIPMENT (SIC 365)[1]
1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in radio and TV receiving equipment | 8,700 | 100.0 |
| 1 | Secretary | 730 | 8.39 |
| 2 | Electrical and electronic assembler | 560 | 6.38 |
| 3 | Unskilled assemblers | 410 | 4.65 |
| 4 | Production packager, hand or machine | 290 | 3.31 |
| 5 | Wirer, electronic | 270 | 3.14 |
| 6 | Inspector | 240 | 2.76 |
| 7 | General clerk | 240 | 2.70 |
| 8 | Electrical and electronic technician | 210 | 2.37 |
| 9 | Engineer, electrical and electronic | 190 | 2.21 |
| 10 | Compression and/or injection molding machine operator, plastics | 170 | 1.95 |

[1] This industry includes high-technology industry phonograph records, video apparatus (SIC 3652).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

Table 18. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN COMMUNICATION EQUIPMENT (SIC 366)[1]
1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in communication equipment | 45,410 | 100.0 |
| 1 | Engineer, electrical and electronic | 3,670 | 8.07 |
| 2 | Electrical and electronic technician | 3,050 | 6.71 |
| 3 | Electrical and electronic assembler | 2,640 | 5.82 |
| 4 | Secretary | 1,920 | 4.22 |
| 5 | Electro-mechanical equipment assembler | 1,200 | 2.65 |
| 6 | Wirer, electronic | 1,120 | 2.48 |
| 7 | Engineer, industrial | 1,100 | 2.41 |
| 8 | Inspector | 1,010 | 2.22 |
| 9 | Unskilled assemblers | 940 | 2.08 |
| 10 | Accountant and auditor | 870 | 1.91 |

[1] This industry includes high-technology industries telephone and telegraph apparatus (SIC 3661) and radio and TV communication equipment (SIC 3662).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 19. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN ELECTRONIC COMPONENTS AND ACCESSORIES (SIC 367)[1]

1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total all occupations in electronic components and accessories | 40,960 | 100.0 |
| 1 | Electrical and electronic assembler | 4,520 | 11.03 |
| 2 | Inspector | 1,860 | 4.55 |
| 3 | Unskilled assemblers | 1,860 | 4.54 |
| 4 | Electrical and electronic technician | 1,710 | 4.17 |
| 5 | Wirer, electronic | 960 | 2.35 |
| 6 | Supervisor, nonworking | 890 | 2.18 |
| 7 | Coil winder | 890 | 2.17 |
| 8 | Secretary | 820 | 2.00 |
| 9 | Tester | 730 | 1.77 |
| 10 | Engineer, industrial | 680 | 1.65 |

[1] This industry includes high-technology industries semiconductors and related devices (SIC 3674), electronic connectors (SIC 3678), and electronic components, n.e.c. (SIC 3679).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 20. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN MISCELLANEOUS ELECTRICAL EQUIPMENT AND SUPPLIES (SIC 369)[1]

1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| 1 | Electrical and electronic assembler | n.p. | n.p. |
| 2 | Wirer, electronic | n.p. | n.p. |
| 3 | Inspector | n.p. | n.p. |
| 4 | Supervisor, nonworking | n.p. | n.p. |
| 5 | Machine tool operator, combination | n.p. | n.p. |
| 6 | Lathe and/or turning machine operator, metal | n.p. | n.p. |
| 7 | Production packager, hand or machine | n.p. | n.p. |
| 8 | Electrical and electronic technician | n.p. | n.p. |
| 9 | Punch press operator, metal | n.p. | n.p. |
| 10 | Machine tool setter, metal working | n.p. | n.p. |

[1] This industry includes high-technology industries primary batteries, dry and wet (SIC 3692) and X-ray apparatus and electromedical equipment (SIC 3693).

n.p. Not publishable.

SOURCE: New York State Department of Labor, Division of Research and Statistics, Occupational Employment Statistics, manufacturing survey data, April-June 1980, unpublished.

### Table 21 THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN MOTOR VEHICLES AND EQUIPMENT (SIC 371) [1]

### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total all occupations in motor vehicles and equipment | 31,670 | 100.00 |
| 1 | Unskilled assemblers | 6,550 | 20.69 |
| 2 | Inspector | 2,010 | 6.36 |
| 3 | Welder and flamecutter | 1,470 | 4.65 |
| 4 | Machine tool setter, metal working | 810 | 2.55 |
| 5 | Mechanic, maintenance | 770 | 2.43 |
| 6 | Industrial truck operator | 700 | 2.20 |
| 7 | Tool and die maker | 600 | 1.88 |
| 8 | Electrician | 570 | 1.80 |
| 9 | Punch press operator, metal | 550 | 1.75 |
| 10 | Drill press and/or boring machine operator | 510 | 1.60 |

[1] This industry includes high technology industries truck and bus bodies (SIC 3713) and truck trailers (SIC 3715).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 22 THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN AIRCRAFT AND PARTS (SIC 372) [1]

### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total all occupations in aircraft and parts | 31,150 | 100.0 |
| 1 | Aircraft structure and surface assembler | 1,630 | 5.22 |
| 2 | Engineer, aeronautical | 1,200 | 3.84 |
| 3 | Unskilled assemblers | 1,100 | 3.54 |
| 4 | Engineer, electrical and electronic | 1,080 | 3.45 |
| 5 | Engineer, industrial | 990 | 3.17 |
| 6 | Inspector | 850 | 2.73 |
| 7 | Accountant and auditor | 790 | 2.52 |
| 8 | Secretary | 740 | 2.38 |
| 9 | Purchasing agent and/or buyer | 560 | 1.80 |
| 10 | Engineer, mechanical | 560 | 1.79 |

[1] This industry includes high technology industry aircraft (SIC 3721).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 23. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN GUIDED MISSILES, SPACE VEHICLES, PARTS (SIC 376) [1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| 1 | Engineer, industrial | n.p. | n.p. |
| 2 | Engineer, aeronautical | n.p. | n.p. |
| 3 | Stenographer | n.p. | n.p. |
| 4 | Engineer, mechanical | n.p. | n.p. |
| 5 | Engineer, electrical and electronic | n.p. | n.p. |
| 6 | Supervisor, nonworking | n.p. | n.p. |
| 7 | Inspector | n.p. | n.p. |
| 8 | Production clerk and/or coordinator | n.p. | n.p. |
| 9 | Electrical and electronic technician | n.p. | n.p. |
| 10 | Welder and flamecutter | n.p. | n.p. |

[1] This industry includes high-technology industries space propulsion units and parts (SIC 3764) and space vehicle equipment, n.e.c. (SIC 3769).

n.p. Not publishable.

SOURCE: New York State Department of Labor, Division of Research and Statistics, Occupational Employment Statistics, manufacturing survey data, April-June 1980, unpublished.

### Table 24. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN ENGINEERING AND SCIENTIFIC INSTRUMENTS (SIC 381) [1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
|  | Total - all occupational in engineering and scientific instruments | 11,250 | 100.0 |
| 1 | Engineer, electrical and electronic | 2,200 | 19.51 |
| 2 | General clerk | 510 | 4.49 |
| 3 | Secretary | 400 | 3.55 |
| 4 | Electrical and electronic technician | 340 | 2.98 |
| 5 | Wirer, electronic | 290 | 2.61 |
| 6 | Electrical and electronic assembler | 290 | 2.53 |
| 7 | Accountant and auditor | 240 | 2.14 |
| 8 | Electro-mechanical equipment assembler | 240 | 2.11 |
| 9 | Production clerk and/or coordinator | 240 | 2.11 |
| 10 | Drafter | 220 | 1.96 |

[1] This industry includes high-technology industry engineering and scientific instruments (SIC 3811).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 25. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN MEASURING AND CONTROLLING DEVICES (SIC 382) [1]

1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in measuring and controlling devices | 11,560 | 100.0 |
| 1 | Instrument maker and/or assembler | 1,160 | 10.04 |
| 2 | Electrical and electronic assembler | 800 | 6.88 |
| 3 | Engineer, electrical and electronic | 680 | 5.89 |
| 4 | Wirer, electronic | 600 | 5.15 |
| 5 | Electro-mechanical equipment assembler | 500 | 4.32 |
| 6 | Electrical and electronic technician | 410 | 3.54 |
| 7 | Secretary | 350 | 3.00 |
| 8 | Supervisor, nonworking | 270 | 2.29 |
| 9 | Production clerk and/or coordinator | 250 | 2.12 |
| 10 | Inspector | 230 | 2.02 |

[1] This industry includes high-technology industries environmental controls (SIC 3822), process control instruments (SIC 3823), meters and counting devices (SIC 3824), instruments to measure electricity (SIC 3825), and measuring and controlling devices, n.e.c. (SIC 3829).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 26. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN OPTICAL INSTRUMENTS AND LENSES (SIC 383) [1]

1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in optical instruments and lenses | 2,870 | 100.0 |
| 1 | Lens grinder | 150 | 5.29 |
| 2 | Filer, grinder, buffer, chipper, cleaner and/or polisher | 150 | 5.19 |
| 3 | Inspector | 140 | 4.94 |
| 4 | Electrical and electronic assembler | 100 | 3.62 |
| 5 | Lathe and/or turning machine operator, metal | 70 | 2.58 |
| 6 | Instrument maker and/or assembler | 70 | 2.37 |
| 7 | Secretary | 60 | 2.02 |
| 8 | Engineer, electrical and electronic | 60 | 1.95 |
| 9 | Grinding machine operator, metal | 50 | 1.88 |
| 10 | Machine tool setter, metal working | 50 | 1.81 |

[1] This industry includes high-technology industry optical instruments and lenses (SIC 3832).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 27. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN MEDICAL INSTRUMENTS AND SUPPLIES (SIC 384)[1]
### 1980

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in medical instruments and supplies | 13,820 | 100.00 |
| 1 | Unskilled assemblers | 1,650 | 11.94 |
| 2 | Production packager, hand or machine | 710 | 5.14 |
| 3 | Instrument maker and/or assembler | 530 | 3.86 |
| 4 | Supervisor, nonworking | 360 | 2.63 |
| 5 | Inspector | 330 | 2.39 |
| 6 | Electro-mechanical equipment assembler | 320 | 2.33 |
| 7 | Secretary | 310 | 2.23 |
| 8 | Sewing machine operator, regular equipment, nongarment | 230 | 1.66 |
| 9 | Filer, grinder, buffer, chipper, cleaner, and/or polisher | 200 | 1.47 |
| 10 | Shipping packer | 180 | 1.28 |

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[1] This industry includes high technology industries surgical and medical instruments (SIC 3841), surgical appliances and supplies (SIC 3842), and dental equipment and supplies (SIC 3843).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Employment by Occupation, Manufacturing, New York State, April-June 1980, Supplement*, Fall 1981.

### Table 28. THE 10 OCCUPATIONS WITH THE LARGEST EMPLOYMENT IN COMPUTER AND DATA PROCESSING SERVICES (SIC 737)[1]
### 1978

| Rank | Occupation | Employment | Percent of total employment |
|---|---|---|---|
| | Total - all occupations in computer and data processing services | 18,500 | 100.00 |
| 1 | Keypunch operator | 3,370 | 18.20 |
| 2 | Computer programmer | 2,280 | 12.30 |
| 3 | Computer operator | 1,670 | 9.03 |
| 4 | Systems analyst, business | 1,200 | 6.46 |
| 5 | Secretary | 630 | 3.42 |
| 6 | General clerk | 580 | 3.13 |
| 7 | Systems analyst, scientific and technical | 440 | 2.40 |
| 8 | Electrical and electronic technician | 390 | 2.12 |
| 9 | Production clerk and/or coordinator | 370 | 19.9 |
| 10 | Accounting clerk | 320 | 1.71 |

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[1] This industry includes high-technology industry computer programming and software (SIC 7372).

SOURCE: New York State Department of Labor, Division of Research and Statistics, *Occupational Employment Statistics, Services, New York State, April-June 1978*, February 1980.

# High-Technology Industries

## In New York State

STATE OF NEW YORK
Mario M. Cuomo, Governor

DEPARTMENT OF LABOR
Lillian Roberts, Commissioner

# Introduction

RISING unemployment coupled with budget restrictions at all levels of government have led administrators and planners to review their plans to improve the economy of the state. Special attention has been focused on attracting new industries and expanding those already located in New York State, particularly in high-technology fields, as these have been a source of substantial and sustained demand for skilled labor.

This report reviews the status of high-technology industries in the state, particularly the 52 industries that have been selected by the Battelle Corporation for their high potential for long-term growth in the state. [1] The report includes information on employment and wages in these 52 industries, [2] detailed by four-digit SIC industry code [3] and by area. To the extent that comparable data were available, comparisons have also been made with high-technology industries nationwide.

Another report, *Occupations in High-Technology*, is also available for $5. It contains information on the occupations found in the 52 industries selected by the Battelle Corporation. Topics covered include occupational staffing patterns, significant occupations, apprenticeable occupations, educational requirements, on-the-job training, and occupational outlook and supply. Two other features are a table providing detailed data on assemblers at the various skill levels by industry, and a tabular presentation of educational and training routes for key occupations in the high-technology industries. ☐

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[1] The Battelle Corporation was commissioned by the New York State Science and Technology Foundation to design a strategy for the development of high-technology activity in New York State.

[2] See Appendix A for definitions of the 52 high-technology industries; and Appendix B for technical notes describing data sources used in this report.

[3] *Standard Industrial Classification Manual* (SIC).

# Highlights

- High-technology industries already comprise a large share of New York State's industrial base. Their payrolls amounted to over $9 billion or 9.9 percent of private sector payrolls in 1980.

- High-technology industry employment in the state averaged 407,700 or 7.0 percent of private employment in 1980.

- The state's share of nationwide employment in high-technology industries declined 1.6 percentage points to 10.6 percent from 1975 to 1980.

- Over one-half of the employment in high-technology industries was attributable to just six industries: photographic equipment and supplies (SIC 3861), electronic computing equipment (SIC 3573), radio and TV communication equipment (SIC 3662), periodicals (SIC 2721), commercial lithographic printing (SIC 2752), and aircraft (SIC 3721).

- The average weekly earnings of high-technology industry workers was $429 compared with $302 for all private sector industries and $355 for all manufacturing industries.

- Of the 52 high technology industries, weekly earnings for workers averaged highest ($623) in the telephone and telegraph apparatus industry (SIC 3661) and lowest ($241) in the office machines, not elsewhere classified (n.e.c.), industry (SIC 3579). Weekly earnings of workers employed in the manufacture of photographic equipment and supplies or electronic computing equipment, the largest industries providing high-technology jobs in the state, averaged $497 and $525 respectively. Nearly one-half (48.0 percent) of the reporting units were in only two industries: periodicals (SIC 2721) and commercial lithographic printing (SIC 2752).

- Some areas of the state had an intense concentration of high-technology activity in 1980; most did not. In each of three areas (Binghamton, Poughkeepsie, and Rochester) about one of every five persons in the civilian labor force was employed in a high technology industry.

- Geographically, 60.1 percent of the employment in high-technology industries in New York State was in the Nassau-Suffolk and Rochester areas and New York City in 1980.

- Electronic connectors; crowns and closures; and computer programming and software were the fastest growing high-technology industries in New York State from 1975 to 1980. □

# Criteria for Industry Selection

NEW York is in a struggle with other states for jobs. For numerous reasons, jobs in high-technology industries are considered as being among the most desirable. Acting on a commission from the New York State Science and Technology Foundation, the Battelle Corporation identified 52 high-technology industries which are both desirable and feasible for New York State. The industries were identified by *Standard Industrial Classification Manual* (SIC) four-digit code and title. Those high-technology industries in which New York has the best competitive position are the subject of this report. High-technology industries in which the state does not enjoy the best potential for long-term growth have been excluded as an area of study.

High technology industries most desirable and feasible for development in New York State tend to:

- Be part of the economic base of the state (that is they bring dollars into the state from outside the state rather than circulating dollars already within the state);
- Grow faster than other components of the economic base;
- Have potential for future employment expansion;
- Offer above average pay scales;
- Be frequently capital intensive, resulting in high productivity and salaries;
- Contract less than other industries with high pay scales during recessionary periods and expand more during upturns;
- Employ a large number of professional and technical workers;
- Employ the "cream of the crop" in nonhigh-technology personnel;
- Include many occupations common to nonhigh-technology industries;
- Have many employees devoted to research and development careers;
- Have cooperative arrangements with secondary schools and take an interest in vocational training programs (because of interest in latest technologies and desire to employ the "cream of the crop" in all occupations);
- Add considerably to the worth of product per employee (i.e., high value added per employee);
- Be comprised of firms with headquarters or administrative offices in New York City;
- Have few negative energy or environmental impacts, and
- Have domestic technology equal or superior to foreign competition. □

# Industries Surveyed

ALL but one of the 52 industries surveyed were engaged in manufacturing. They accounted for two of every seven jobs in manufacturing in the state (27.9 percent). The one nonmanufacturing industry (SIC 7372) provided computer programming and software services.

The following is a listing of the 52 industries, including their standard industrial classification (SIC) code designation:

| SIC code | Industry |
|---|---|
| 2721 | Periodicals |
| 2752 | Commercial lithographic printing |
| 2819 | Industrial inorganic chemicals, n.e.c. |
| 2831 | Biological products |
| 2833 | Medicinals and botanicals |
| 2844 | Toilet preparations |
| 2869 | Industrial organic chemicals, n.e.c. |
| 2879 | Agricultural chemicals, n.e.c. |
| 2891 | Adhesives and sealants |
| 3465 | Automotive stampings |
| 3466 | Crowns and closures |
| 3531 | Construction machinery |
| 3532 | Mining machinery |
| 3551 | Food products machinery |
| 3559 | Special industry machinery, n.e.c. |
| 3569 | General industrial machinery, n.e.c. |
| 3573 | Electronic computing equipment |
| 3576 | Scales and balances, except laboratory |
| 3579 | Office machines, n.e.c. |
| 3613 | Switchgear and switchboard apparatus |
| 3622 | Industrial controls |
| 3623 | Welding apparatus, electric |
| 3641 | Electric lamps |
| 3643 | Current-carrying wiring devices |
| 3644 | Noncurrent-carrying wiring devices |
| 3645 | Residential lighting fixtures |
| 3647 | Vehicular lighting equipment |
| 3652 | Phonograph records, video apparatus |
| 3661 | Telephone and telegraph apparatus |
| 3662 | Radio and TV communication equipment |
| 3674 | Semiconductors and related devices |
| 3678 | Electronic connectors |
| 3679 | Electronic components, n.e.c. |
| 3692 | Primary batteries, dry and wet |
| 3693 | X-ray apparatus and electromedical equipment |
| 3713 | Truck and bus bodies |
| 3715 | Truck trailers |
| 3721 | Aircraft |
| 3764 | Space propulsion units and parts |
| 3769 | Space vehicle equipment, n.e.c. |
| 3811 | Engineering and scientific instruments |
| 3822 | Environmental controls |
| 3823 | Process control instruments |
| 3824 | Fluid meters and counting devices |
| 3825 | Instruments to measure electricity |
| 3829 | Measuring and controlling devices, n.e.c. |
| 3832 | Optical instruments and lenses |
| 3841 | Surgical and medical instruments |
| 3842 | Surgical appliances and supplies |
| 3843 | Dental equipment and supplies |
| 3861 | Photographic equipment and supplies |
| 7372 | Computer programming and software |

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NOTE: n.e.c. (not elsewhere classified) is used to group industries not classified in other 4-digit codes that fall within the 3-digit classification. □

# New York State's Share of United States Employment in High-Technology Industries

NEW York State in 1980 accounted for 7.4 percent of the total U.S. civilian labor force, 8.0 percent of the nation's jobs in nonagricultural industries, and roughly 11.0 percent of the employment in the nation's 52 high-technology industries surveyed (see Chart 1).

Comparative industry data for both New York and the nation were available for 31 of the 52 industries covered in the report. In 1980, these 31 industries employed 90.2 percent of the workers in high-technology jobs in the state, and they accounted for 10.6 percent of the nation's employment in these industries.

New York's share of the nation's high-technology jobs in the 31 industries varied widely by industry, ranging from a high of 57.6 percent in the photographic equipment and supplies industry, to a low of 0.2 percent in mining machinery (see Table 1). □

**Chart 1. NEW YORK STATE AS A PERCENT OF UNITED STATES:**

- POPULATION
- CIVILIAN LABOR FORCE
- JOBS IN NONAGRICULTURAL INDUSTRIES
- JOBS IN HIGH-TECHNOLOGY INDUSTRIES

1980

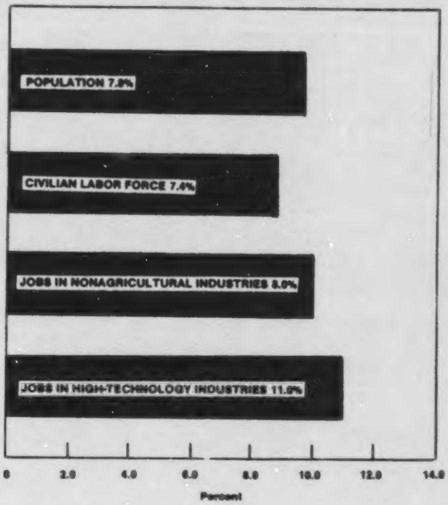

Table 1. NEW YORK STATE EMPLOYMENT AS PERCENT OF UNITED STATE EMPLOYMENT IN SELECTED HIGH-TECHNOLOGY INDUSTRIES, 1980

| SIC code | Industry | Percent of U.S. employment |
|---|---|---|
| 3861 | Photographic equipment and supplies | 57.6 |
| 2721 | Periodicals | 30.3 |
| 2844 | Toilet preparations | 21.3 |
| 3644 | Noncurrent-carrying wiring devices | 18.7 |
| 3652 | Phonograph records, video apparatus | 17.2 |
| 3645 | Residential lighting fixtures | 15.3 |
| 3811 | Engineering and scientific instruments | 14.7 |
| 3643 | Current-carrying wiring devices | 14.5 |
| 3573 | Electronic computing equipment | 13.5 |
| 2752 | Commercial lithographic printing | 11.1 |
| 3662 | Radio and TV communication equipment | 10.8 |
|  | ALL 31 INDUSTRIES | 10.6 |
| 3841 | Surgical and medical instruments | 8.9 |
| 3832 | Optical instruments and lenses | 8.2 |
| 3842 | Surgical applicances and supplies | 7.7 |
| 3823 | Process control instruments | 7.4 |
| 3674 | Semiconductors and related devices | 6.7 |
| 3679 | Electronic components, n.e.c. | 6.6 |
| 3721 | Aircraft | 6.4 |
| 3551 | Food products machinery | 5.5 |
| 3622 | Industrial controls | 5.4 |
| 2869 | Industrial inorganic chemicals, n.e.c. | 4.4 |
| 3613 | Switchgear and switchboard apparatus | 3.9 |
| 3465 | Automotive stampings | 3.7 |
| 3641 | Electric lamps | 3.6 |
| 3825 | Instruments to measure electricity | 3.5 |
| 3661 | Telephone and telegraph apparatus | 3.1 |
| 3822 | Environmental controls | 2.4 |
| 3713 | Truck and bus bodies | 2.0 |
| 3715 | Truck trailers | 1.6 |
| 3531 | Construction machinery | 1.1 |
| 3532 | Mining machinery | 0.2 |

# Trends in Employment in High-Technology Industries 1975-1980

FROM 1975 to 1980, the number of jobs in high-technology industries in New York State and the United States increased at a faster rate than jobs in all manufacturing and in all private sector industries. This increase reflected the vitality of high-techonology industries. The growth rate was more than double that of the civilian labor force in both the state and nation. The labor force and employment in high-technology industries, however, expanded much more rapidly in the United States than in New York State. This to some extent may reflect the early development of high-technology jobs in New York compared with other parts of the country (see Table 2.)

**Table 2. Rates of Growth for Selected Industry Groups and the Civilian Labor Force New York State and the United States 1975-1980**

| Industry group | Growth rate 1975-1980 | |
|---|---|---|
| | New York State | United States |
| 31 high-technology industries | 11.9 | 29.1 |
| 52 high-technology industries | 11.5 | n.a. |
| Manufacturing industries, total | 1.9 | 10.7 |
| Private sector industries, total | 8.1 | 19.1 |
| Civilian labor force | 4.5 | 14.0 |

n.a. Not available

As a group, employment for the 31 industries expanded 29.1 percent nationwide compared with 11.9 percent in New York. Only six of the 31 industries grew at a faster pace in New York than nationally. They were:

| SIC code | Industry |
|---|---|
| 3613 | Switchgear and switchboard apparatus |
| 3641 | Electric lamps |
| 3643 | Current-carrying wiring devices |
| 3652 | Phonograph records, video apparatus |
| 3662 | Radio and TV communication equipment |
| 3822 | Environmental controls |

Employment declined between 1975 and 1980 in both the state and nation in two industries: construction machinery (SIC 3531) and truck and bus bodies (SIC 3713). However, it dropped at a slower pace in the state than in the nation, expecially in the truck and bus bodies industry, because the decline in the state commenced prior to 1975.

In five industries, employment declined in the state but expanded nationally. The industries were:

| SIC code | Industry |
|---|---|
| 2819 | Industrial inorganic chemicals, n.e.c. |
| 3465 | Automotive stampings |
| 3644 | Noncurrent-carrying wiring devices |
| 3661 | Telephone and telegraph apparatus |
| 3721 | Aircraft |

Rates of growth for the 31 high-technology industries from 1975 to 1980 in the United State and New York are shown in Table 3. The table also includes United States employment in these industries in 1975 and 1980.

Since employment in high-technology industries expanded more rapidly in the United States than in New York, the state's share of the nation's high-technology employment declined from 1975-1980. In 1975, New York accounted for 12.2 percent of the nation's high-technology jobs in the 31 industries, but by 1980 the percentage had dropped to 10.6. The state's share declined in 23 industries, remained the same in one, and expanded in seven others (see Table 4). The high-technology industries with the greatest concentration in New York -- photographic equipment and supplies (SIC 3861), and periodicals (SIC 2721) -- were among industries employing proportionately fewer workers in New York at the end of the period. □

## Table 3. EMPLOYMENT IN UNITED STATES AND RATES OF GROWTH FOR UNITED STATES AND NEW YORK STATE IN SELECTED HIGH-TECHNOLOGY INDUSTRIES, 1980 AND 1975

| SIC code | Industry | United States employment (000's) | | Rate of growth from 1975 to 1980 | |
|---|---|---|---|---|---|
| | | 1980 | 1975 | United States | New York State |
| 2721 | Periodicals | 88.4 | 68.1 | 29.8 | 11.1 |
| 2752 | Commercial lithographic printing | 229.5 | 167.3 | 37.2 | 16.6 |
| 2819 | Industrial inorganic chemicals, n.e.c. | 106.8 | 96.2 | 11.0 | -3.2 |
| 2844 | Toilet preparations | 55.5 | 48.9 | 13.5 | 11.1 |
| 3465 | Automotive stampings | 94.3 | 82.1 | 14.9 | -23.7 |
| 3531 | Construction machinery | 148.5 | 156.8 | -5.6 | -0.5 |
| 3532 | Mining machinery | 37.9 | 31.8 | 19.2 | 7.0 |
| 3551 | Food products machinery | 46.2 | 40.6 | 13.8 | 5.4 |
| 3573 | Electronic computing equipment | 350.2 | 210.4 | 66.4 | 19.6 |
| 3613 | Switchgear and switchboard apparatus | 69.0 | 60.5 | 14.0 | 29.2 |
| 3622 | Industrial controls | 72.2 | 60.6 | 19.1 | 17.1 |
| 3641 | Electric lamps | 36.4 | 35.4 | 2.8 | 47.7 |
| 3643 | Current-carrying wiring devices | 88.5 | 70.7 | 25.2 | 26.3 |
| 3644 | Noncurrent carrying wiring devices | 22.4 | 20.9 | 7.2 | -8.3 |
| 3645 | Residential lighting fixtures | 25.3 | 20.2 | 24.6 | 7.7 |
| 3652 | Phonograph records, video apparatus | 23.7 | 22.1 | 7.2 | 8.8 |
| 3661 | Telephone and telegraph apparatus | 162.9 | 147.5 | 10.4 | -37.3 |
| 3662 | Radio and TV communications equipment | 376.3 | 309.8 | 21.5 | 25.3 |
| 3674 | Semiconductors and related devices | 226.9 | 121.7 | 86.4 | 9.2 |
| 3679 | Electronic components, n.e.c. | 215.3 | 130.8 | 64.6 | 48.9 |
| 3713 | Truck and bus bodies | 38.6 | 45.5 | -17.9 | -1.7 |
| 3715 | Truck trailers | 28.0 | 19.2 | 45.8 | 19.7 |
| 3721 | Aircraft | 354.1 | 292.8 | 20.9 | -11.2 |
| 3811 | Engineering and scientific instruments | 76.8 | 61.7 | 24.5 | 11.8 |
| 3822 | Environmental controls | 47.4 | 37.3 | 27.1 | 38.8 |
| 3823 | Process control instruments | 52.9 | 41.0 | 29.0 | 24.8 |
| 3825 | Instruments to measure electricity | 102.1 | 60.4 | 69.0 | 11.0 |
| 3832 | Optical instruments and lenses | 32.9 | 22.2 | 48.2 | 9.6 |
| 3841 | Surgical and medical instruments | 71.5 | 41.9 | 70.6 | 32.5 |
| 3842 | Surgical appliances and supplies | 66.7 | 52.7 | 26.6 | 18.8 |
| 3861 | Photographic equipment and supplies | 135.5 | 121.1 | 11.9 | 5.7 |

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Table 4. NEW YORK STATE EMPLOYMENT AS A PERCENT OF UNITED STATES EMPLOYMENT IN SELECTED HIGH-TECHNOLOGY INDUSTRIES, 1980 AND 1975

| SIC code | Industry | State as a percent of USA | | Percentage change from 1975 to 1980 |
|---|---|---|---|---|
| | | 1980 | 1975 | |
| | TOTAL | 10.6 | 12.2 | -1.6 |
| 2721 | Periodicals | 30.3 | 35.4 | -5.1 |
| 2752 | Commercial lithographic printing | 11.1 | 13.1 | -2.0 |
| 2819 | Industrial inorganic chemicals, n.e.c. | 4.4 | 5.0 | -0.6 |
| 2844 | Toilet preparations | 21.3 | 21.7 | -0.4 |
| 3465 | Automotive stampings | 3.7 | 5.6 | -1.9 |
| 3531 | Construction machinery | 1.1 | 1.1 | - |
| 3532 | Mining machinery | 0.2 | 0.3 | -0.1 |
| 3553 | Food products machinery | 5.5 | 6.0 | -0.5 |
| 3573 | Electronic computing equipment | 13.5 | 18.8 | -5.3 |
| 3613 | Switchgear and switchboard apparatus | 3.9 | 3.5 | 0.4 |
| 3622 | Industrial controls | 5.4 | 5.5 | -0.1 |
| 3641 | Electric lamps | 3.6 | 2.5 | 1.1 |
| 3643 | Current carrying wiring devices | 14.5 | 14.3 | 0.2 |
| 3644 | Noncurrent carrying wiring devices | 18.7 | 21.8 | -3.1 |
| 3645 | Residential lighting fixtures | 15.3 | 17.8 | -2.5 |
| 3652 | Phonograph records, video | 17.2 | 17.0 | 0.2 |
| 3661 | Telephone and telegraph apparatus | 3.1 | 5.4 | -2.3 |
| 3662 | Radio and TV communication equipment | 10.8 | 10.3 | 0.5 |
| 3674 | Semiconductors and related devices | 6.7 | 11.5 | -4.8 |
| 3679 | Electronic components, n.e.c. | 6.6 | 7.3 | -0.7 |
| 3713 | Truck and bus bodies | 2.0 | 1.7 | 0.3 |
| 3715 | Truck trailers | 1.6 | 2.0 | -0.4 |
| 3721 | Aircraft | 6.4 | 8.7 | -2.3 |
| 3811 | Engineering and scientific instruments | 14.7 | 16.3 | -1.6 |
| 3822 | Environmental controls | 2.4 | 2.2 | 0.2 |
| 3823 | Process control instruments | 7.4 | 7.7 | -0.3 |
| 3825 | Instruments to measure electricity | 3.5 | 5.3 | -1.8 |
| 3832 | Optical instruments and lenses | 8.2 | 11.1 | -2.9 |
| 3841 | Surgical and medical instruments | 8.9 | 11.5 | -2.6 |
| 3842 | Surgical appliances and supplies | 7.7 | 8.2 | -0.5 |
| 3861 | Photographic equipment and supplies | 57.6 | 61.0 | -3.4 |

# Statewide Employment in High-Technology Industries 1980

EMPLOYMENT in New York State's high-technology fields was concentrated in a handful of industries. In 1980, six of the 52 industries accounted for 59.3 percent of the 407,700 high-technology jobs.

Jobs in photographic equipment and supplies alone comprised nearly one of every five jobs followed by electronic computing equipment, which accounted for one in every nine jobs, and radio and TV communication equipment -- one of every 10.

Of the 52 industries in New York surveyed, six employed 20,000 or more workers; 10 employed between 5,000 and 19,999; 21 employed 1,000 to 4,999; and 15 employed fewer than 1,000. The 52 high-technology industries are ranked by employment in Table 5.

| SIC code | Industry | Employment |
|---|---|---|
| 3861 | Photographic equipment and supplies | 78,100 |
| 3573 | Electronic computing equipment | 47,200 |
| 3662 | Radio and TV communication equipment | 40,500 |
| 2721 | Periodicals | 26,800 |
| 2752 | Commercial lithographic printing | 25,500 |
| 3721 | Aircraft | 22,700 |

**Chart 2. DISTRIBUTION OF EMPLOYMENT SELECTED HIGH-TECHNOLOGY INDUSTRIES NEW YORK STATE, 1980**

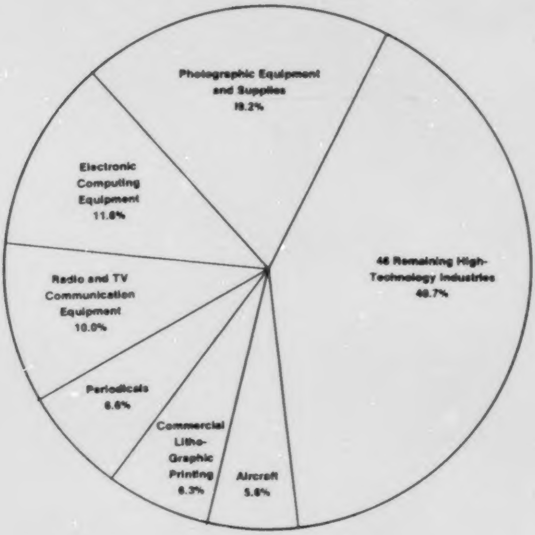


Table 5. HIGH-TECHNOLOGY INDUSTRIES RANKED BY EMPLOYMENT
NEW YORK STATE, 1980

| Rank | SIC code | Industry | Employment (000's) |
|---|---|---|---|
| 1 | 3861 | Photographic equipment and supplies | 78.1 |
| 2 | 3573 | Electronic computing equipment | 47.2 |
| 3 | 3662 | Radio and TV communication equipment | 40.5 |
| 4 | 2721 | Periodicals | 26.8 |
| 5 | 2752 | Commercial lithographic printing | 25.5 |
| 6 | 3721 | Aircraft | 22.7 |
| 7 | 3674 | Semiconductors and related devices | 15.3 |
| 8 | 3679 | Electronic components, n.e.c. | 14.2 |
| 9 | 3643 | Current-carrying wiring devices | 12.8 |
| 10 | 2844 | Toilet preparations | 11.8 |
| 11 | 3811 | Engineering and scientific instruments | 11.3 |
| 12 | 2869 | Industrial organic chemicals, n.e.c. | 9.5 |
| 13 | 3841 | Surgical and medical instruments | 6.4 |
| 14 | 3842 | Surgical appliances and supplies | 5.1 |
| 15.5 | 3569 | General industrial machinery, n.e.c. | 5.0 |
| 15.5 | 3661 | Telephone and telegraph apparatus | 5.0 |
| 17 | 2819 | Industrial inorganic chemicals, n.e.c. | 4.7 |
| 18 | 3559 | Special industry machinery, n.e.c. | 4.3 |
| 19.5 | 3644 | Noncurrent-carrying wiring devices | 4.2 |
| 19.5 | 7372 | Computer programming and software | 4.2 |
| 21 | 3652 | Phonograph records, video apparatus | 4.1 |
| 23 | 3823 | Process control instruments | 3.9 |
| 23 | 3622 | Industrial controls | 3.9 |
| 23 | 3645 | Residential lighting fixtures | 3.9 |
| 25 | 3825 | Instruments to measure electricity | 3.6 |
| 26 | 3465 | Automotive stampings | 3.5 |
| 27 | 3829 | Measuring and controlling devices, n.e.c. | 2.9 |
| 28.5 | 3613 | Switchgear and switchboard apparatus | 2.7 |
| 28.5 | 3832 | Optical instruments and lenses | 2.7 |
| 30 | 3551 | Food products machinery | 2.6 |
| 31.5 | 3579 | Office machines, n.e.c. | 2.0 |
| 31.5 | 3843 | Dental equipment and supplies | 2.0 |
| 33 | 3764 | Space propulsion units and parts | 1.7 |
| 34.5 | 3531 | Construction machinery | 1.6 |
| 34.5 | 3693 | X-ray apparatus and electromedical equipment | 1.6 |
| 36 | 3641 | Electric lamps | 1.3 |
| 37 | 3822 | Environmental controls | 1.1 |
| 39.5 | 2833 | Medicinals and botanicals | 0.8 |
| 39.5 | 3678 | Electronic connectors | 0.8 |
| 39.5 | 3692 | Primary batteries, dry and wet | 0.8 |

Table 5. HIGH-TECHNOLOGY INDUSTRIES RANKED BY EMPLOYMENT NEW YORK STATE--Continued

| Rank | SIC code | Industry | Employment (000's) |
|---|---|---|---|
| 39.5 | 3713 | Truck and bus bodies | 0.8 |
| 43 | 2891 | Adhesives and sealants | 0.7 |
| 43 | 3647 | Vehicular lighting equipment | 0.7 |
| 43 | 2831 | Biological products | 0.7 |
| 45.5 | 2879 | Agricultural chemicals, n.e.c. | 0.6 |
| 45.5 | 3576 | Scales and balances, except laboratory | 0.6 |
| 47.5 | 3623 | Welding apparatus, electric | 0.5 |
| 47.5 | 3715 | Truck trailers | 0.5 |
| 49 | 3466 | Crowns and closures | 0.4 |
| 50 | 3824 | Fluid meters and counting devices | 0.3 |
| 51.5 | 3532 | Mining machinery | 0.1 |
| 51.5 | 3769 | Space vehicle equipment, n.e.c. | 0.1 |

Between 1975 and 1980, 38 of the 52 industries surveyed reported job gains in the state. The largest growth occurred in establishments manufacturing radio and television transmitting, signaling and detection equipment and apparatus (a rise of 8,400) and in establishments manufacturing electronic computing equipment (a rise of 7,700). Six other industries experienced increases of 2,000 to 4,700.

Employment declined in 10 industries, the largest of which were in the telephone and telegraph equipment manufacturing groups — a drop of 3,000 — and in aircraft manufacturing — a loss of 2,900. No employment changes were reported in four industries.

The 52 high-technology industries are ranked by employment change in Table 6.

Table 6. HIGH TECHNOLOGY INDUSTRIES RANKED BY CHANGE IN NUMBER OF JOBS NEW YORK STATE, 1975-1980

| Rank | SIC code | Industry | Change in employment (000's) |
|---|---|---|---|
| 1 | 3662 | Radio and TV communication equipment | +8.4 |
| 2 | 3573 | Electronic computing equipment | +7.7 |
| 3 | 3679 | Electronic components, n.e.c. | +4.7 |
| 4 | 3861 | Photographic equipment and supplies | +4.2 |
| 5 | 2752 | Commercial lithographic printing | +3.6 |
| 6 | 3772 | Computer programming and software | +2.8 |
| 7.5 | 2721 | Periodicals | +2.7 |
| 7.5 | 3643 | Current-carrying wiring devices | +2.7 |
| 9 | 3841 | Surgical and medical instruments | +1.6 |
| 10 | 3674 | Semiconductors and related devices | +1.3 |
| 11.5 | 3811 | Engineering and scientific instruments | +1.2 |
| 11.5 | 2844 | Toilet preparations | +1.2 |
| 13.5 | 3842 | Surgical appliances and supplies | +0.8 |
| 13.5 | 3823 | Process control instruments | +0.8 |
| 17.5 | 3678 | Electronic connectors | +0.6 |
| 17.5 | 3829 | Measuring and controlling devices, n.e.c. | +0.6 |
| 17.5 | 3613 | Switchgear and switchboard apparatus | +0.6 |
| 17.5 | 3569 | General industrial machinery, n.e.c. | +0.6 |
| 17.5 | 3559 | Special industry machinery, n.e.c. | +0.6 |
| 17.5 | 3622 | Industrial controls | +0.6 |
| 21.5 | 3693 | X-ray apparatus and electromedical equipment | +0.5 |
| 21.5 | 2833 | Medicinals and botanicals | +0.5 |
| 23.5 | 3641 | Electric lamps | +0.4 |
| 23.5 | 3825 | Instruments to measure electricity | +0.4 |
| 27 | 3652 | Phonograph records, video apparatus | +0.3 |
| 27 | 3822 | Environmental controls | +0.3 |
| 27 | 3692 | Primary batteries, dry and wet | +0.3 |
| 27 | 3466 | Crowns and closures | +0.3 |
| 27 | 3645 | Residential lighting fixtures | +0.3 |
| 31.5 | 3832 | Optical instruments and lenses | +0.2 |

Table 6. HIGH TECHNOLOGY INDUSTRIES RANKED BY CHANGE IN NUMBER OF JOBS NEW YORK STATE–Continued

| Rank | SIC code | Industry | Change in employment (000's) |
|---|---|---|---|
| 31.5 | 2831 | Biological products | +0.2 |
| 31.5 | 3824 | Fluid meters and counting devices | +0.2 |
| 31.5 | 3579 | Office machines, n.e.c. | +0.2 |
| 36 | 3551 | Food products machinery | +0.1 |
| 36 | 2891 | Adhesives and sealants | +0.1 |
| 36 | 3576 | Scales and balances, except laboratory | +0.1 |
| 36 | 3715 | Truck trailers | +0.1 |
| 36 | 3647 | Vehicular lighting equipment | +0.1 |
| 40.5 | 3532 | Mining machinery | 0.0 |
| 40.5 | 3531 | Construction machinery | 0.0 |
| 40.5 | 3713 | Truck and bus bodies | 0.0 |
| 40.5 | 3623 | Welding apparatus, electric | 0.0 |
| 43 | 3769 | Space vehicle equipment, n.e.c. | -0.1 |
| 44.5 | 2879 | Agricultural chemicals, n.e.c. | -0.2 |
| 44.5 | 2819 | Industrial inorganic chemicals, n.e.c. | -0.2 |
| 46 | 3644 | Noncurrent-carrying wiring devices | -0.4 |
| 47 | 3764 | Space propulsion units and parts | -0.5 |
| 48 | 2869 | Industrial organic chemicals, n.e.c. | -0.7 |
| 49 | 3843 | Dental equipment and supplies | -0.8 |
| 50 | 3465 | Automotive stampings | -1.1 |
| 51 | 3721 | Aircraft | -2.9 |
| 52 | 3661 | Telephone and telegraph apparatus | -3.0 |

Employment grew at a more rapid rate among small high technology industries than among large ones. Table 7 shows the relationships among three measures of activity related to the job market – employment in 1980; increase in employment between 1975 and 1980; and rate of growth between 1975 and 1980. It includes three columns, each of which lists the 10 industries that were leaders in the respective measures.

Although eight of the 10 largest industries shown in column one were also listed among the 10 industries that reported the largest employment gains between 1975 and 1980 (column two), only one industry – electronic components, n.e.c. – appeared in all three columns. In other words, although industries that employed comparatively large numbers of workers in 1980 had gained most in total employment, their rate of growth was considerably below that of smaller industries. Thus, the electronic connectors industry, which ranked 40th in total employment among the 52 industries studied (see Table 5), achieved the highest growth rate between 1975 and 1980 (371 percent). The crowns and closures industry, whose primary product is bottle caps and top and jar crowns, ranked 49th in total employment in 1980, and achieved an employment growth rate of 359 percent during this period.

Table 7  TOP 10 HIGH TECHNOLOGY INDUSTRIES BY EMPLOYMENT
BY INCREASE IN EMPLOYMENT, AND BY GROWTH RATE
NEW YORK STATE

| Rank | Employment 1980 | Increase in employment 1975-1980 | Growth rate 1975-1980 (percent) |
|---|---|---|---|
| 1 | Photographic equipment and supplies* (78,100) | Radio and TV communication equipment* (8,400) | Electronic connectors (370.9) |
| 2 | Electronic computing equipment* (47,200) | Electronic computing equipment* (7,700) | Crowns and closures (358.8) |
| 3 | Radio and TV communication equipment* (40,500) | Electronic components, n.e.c.** (4,700) | Computer programming and software* (201.7) |
| 4 | Periodicals* (26,800) | Photographic equipment and supplies* (4,200) | Fluid meters and counting devices (168.1) |
| 5 | Commercial lithographic printing* (25,500) | Commercial lithographic printing* (3,600) | Medicinals and botanicals (125.3) |
| 6 | Aircraft (22,700) | Computer programming and software* (2,800) | Primary batteries, dry and wet (60.1) |
| 7 | Semiconductors and related devices* (15,300) | Periodicals* (2,700) | X-ray apparatus and electromedical equipment (50.7) |
| 8 | Electronic components, n.e.c.** (14,200) | Current-carrying wiring devices* (2,700) | Electronic components, n.e.c.** (48.9) |
| 9 | Current-carrying wiring devices* (12,800) | Surgical and medical instruments (1,600) | Electric lamps (47.7) |
| 10 | Toilet preparations (11,800) | Semiconductors and related devices* (1,300) | Environmental controls (38.8) |

* Industry is included among the top 10 in another category.
** Industry is included among the top 10 in two other categories.

Table 8 shows for high-technology industries in New York State the number of establishments covered under the New York State Unemployment Insurance Law in 1980, their average employment, and the average weekly earnings of their employees. Nearly one-half of the firms were in only two industries: periodicals and commercial lithographic printing.

Table 8. NUMBER OF REPORTING ESTABLISHMENTS, AVERAGE EMPLOYMENT
AND AVERAGE WEEKLY EARNINGS OF WORKERS
HIGH-TECHNOLOGY INDUSTRIES
NEW YORK STATE, 1980

| SIC code | Industry | Reporting establishments [1] | Average employment (000's) | Average weekly earnings |
|---|---|---|---|---|
| 2721 | Periodicals | 711 | 26.8 | $449 |
| 2752 | Commercial lithographic printing | 1,811 | 25.5 | 369 |
| 2819 | Industrial inorganic chemicals, n.e.c. | 40 | 4.7 | 495 |
| 2831 | Biological products | 14 | 0.7 | 256 |
| 2833 | Medicinals and botanicals | 12 | 0.8 | 383 |
| 2844 | Toilet preparations | 109 | 11.8 | 470 |
| 2869 | Industrial organic chemicals, n.e.c. | 52 | 9.5 | 531 |
| 2879 | Agricultural chemicals, n.e.c. | 18 | 0.6 | 375 |
| 2891 | Adhesives and sealants | 40 | 0.7 | 342 |
| 3465 | Automotive stampings | 6 | 3.5 | 554 |
| 3466 | Crowns and closures | 4 | 0.4 | 350 |
| 3531 | Construction machinery | 27 | 1.6 | 330 |
| 3532 | Mining machinery | 5 | 0.1 | 296 |
| 3551 | Food products machinery | 71 | 2.6 | 342 |
| 3559 | Special industry machinery, n.e.c. | 81 | 4.3 | 348 |
| 3569 | General industrial machinery, n.e.c. | 75 | 5.0 | 386 |
| 3573 | Electronic computing equipment | 83 | 47.2 | 525 |
| 3576 | Scales and balances, except laboratory | 5 | 0.6 | 300 |
| 3579 | Office machines, n.e.c. | 24 | 2.0 | 241 |
| 3613 | Switchgear and switchboard apparatus | 47 | 2.7 | 283 |
| 3622 | Industrial controls | 42 | 3.9 | 384 |
| 3623 | Welding apparatus, electric | 6 | 0.5 | 396 |
| 3641 | Electric lamps | 15 | 1.3 | 292 |
| 3643 | Current-carrying wiring devices | 57 | 12.8 | 273 |
| 3644 | Noncurrent-carrying wiring devices | 22 | 4.2 | 363 |
| 3645 | Residential lighting fixtures | 145 | 3.9 | 243 |
| 3647 | Vehicular lighting equipment | 9 | 0.7 | 286 |
| 3652 | Phonograph records, video | 138 | 4.1 | 388 |
| 3661 | Telephone and telegraph apparatus | 28 | 5.0 | 623 |
| 3662 | Radio and TV communication equipment | 213 | 40.5 | 390 |
| 3674 | Semiconductors and related devices | 45 | 15.3 | 420 |
| 3678 | Electronic connectors | 5 | 0.8 | 255 |
| 3679 | Electronic components, n.e.c. | 236 | 14.2 | 269 |
| 3692 | Primary batteries, dry and wet | 6 | 0.8 | 333 |
| 3693 | X-ray apparatus and electromedical equipment | 19 | 1.6 | 333 |

See footnote at end of table.

Table 8. NUMBER OF REPORTING ESTABLISHMENTS, AVERAGE EMPLOYMENT
AND AVERAGE WEEKLY EARNINGS OF WORKERS
HIGH TECHNOLOGY INDUSTRIES
NEW YORK STATE--Continued

| SIC code | Industry | Reporting establishments [1] | Average employment (000's) | Average weekly earnings |
|---|---|---|---|---|
| 3713 | Truck and bus bodies | 27 | 0.8 | $263 |
| 3715 | Truck trailers | 6 | 0.5 | 273 |
| 3721 | Aircraft | 5 | 22.7 | 510 |
| 3764 | Space propulsion units and parts | 3 | 1.7 | 472 |
| 3769 | Space vehicle equipment, n.e.c. | 7 | 0.1 | 426 |
| 3811 | Engineering and scientific instruments | 78 | 11.3 | 447 |
| 3822 | Environmental controls | 23 | 1.1 | 255 |
| 3823 | Process control instruments | 35 | 3.9 | 337 |
| 3824 | Fluid meters and counting devices | 12 | 0.3 | 287 |
| 3825 | Instruments to measure electricity | 50 | 3.6 | 330 |
| 3829 | Measuring and controlling devices, n.e.c. | 54 | 2.9 | 308 |
| 3832 | Optical instruments and lenses | 65 | 2.7 | 322 |
| 3841 | Surgical and medical instruments | 71 | 6.4 | 250 |
| 3842 | Surgical appliances and supplies | 120 | 5.1 | 281 |
| 3843 | Dental equipment and supplies | 37 | 2.0 | 322 |
| 3861 | Photographic equipment and supplies | 127 | 78.1 | 497 |
| 7372 | Computer programming and software | 314 | 4.2 | 428 |
|  | 52 High technology industries | 5,255 | 407.7 | 429 |
|  | All manufacturing | 32,967 | 1,450.9 | 355 |
|  | Durable goods | 10,871 | 746.1 | 385 |
|  | Nondurable goods | 22,096 | 704.9 | 322 |
|  | All private sector | 409,220 | 5,858.7 | 302 |

[1] Establishments covered by the New York State Unemployment Insurance Law.

# Average Weekly Earnings in High-Technology Industries in New York State

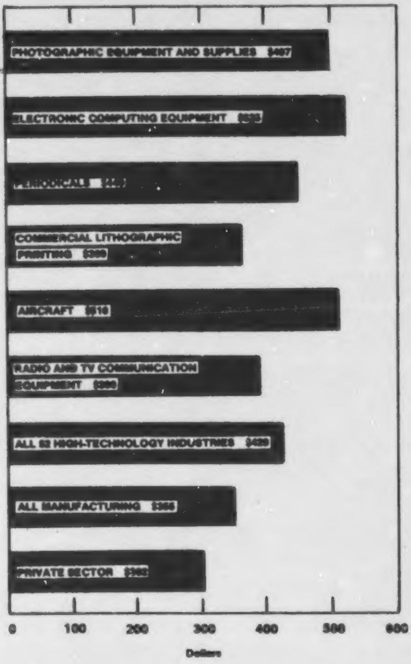
AVERAGE weekly earnings of employees in the six largest high-technology industries were higher than comparable earnings of workers in all manufacturing, and in all private sector industries (see Chart 3). Of the six largest industries, weekly earnings of the workers averaged the most for electronic computing equipment ($525) and the least for commercial lithographic printing ($369). Of the 52 high-technology industries, weekly earnings averaged highest in telephone and telegraph apparatus ($623) and lowest in office machines, n.e.c. ($241), followed closely by residential lighting fixtures ($243) (see Table 8). Despite generally above average pay scales for specific occupations, weekly earnings in 17 high-technology fields averaged less than the average in all private-sector industries. This may be a function of the occupational mix in these industries.

In most cases, industries in which lower average weekly earnings were received by workers employed relatively few workers. With exceptions of noncurrent carrying wiring devices; electronic components, n.e.c.; surgical appliances and supplies; and surgical and medical instruments, these industries employed fewer than 5,000 workers. ☐

**Chart 3. AVERAGE WEEKLY EARNINGS:**

- **LARGEST HIGH-TECHNOLOGY INDUSTRIES**
- **ALL 52 HIGH-TECHNOLOGY INDUSTRIES**
- **ALL MANUFACTURING**
- **ALL PRIVATE SECTOR INDUSTRIES**

**NEW YORK STATE**
**1980**



# Geographic Distribution of High-Technology Industries in New York State

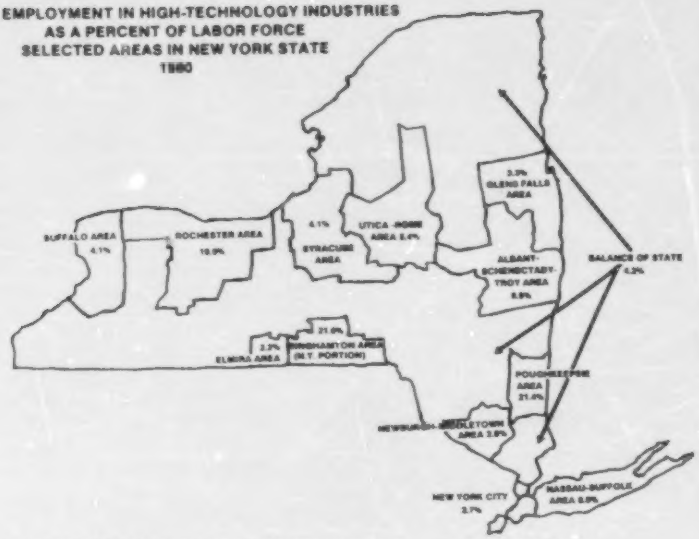
ALTHOUGH there was some high-technology activity in each of the state's major metropolitan areas as defined below and shown on the map on page 20, measured in terms of employment as a percent of labor force, the concentration was heaviest in three: Binghamton (21.6 percent), Poughkeepsie (21.4 percent), and Rochester (19.0 percent).

| **Area** | **Defined as:** |
|---|---|
| New York City | Bronx, Kings, New York, Queens, and Richmond counties |
| Remainder of state: | |
| Albany-Schtdy-Troy | Albany, Montgomery, Rensselaer, Saratoga, and Schenectady counties |
| Binghamton (NY portion) | Broome and Tioga counties |
| Buffalo | Erie and Niagara counties |
| Elmira | Chemung County |
| Glens Falls | Warren and Washington counties |
| Nassau-Suffolk | Nassau and Suffolk counties |
| Newburgh-Middletown | Orange County |
| Poughkeepsie | Dutchess County |
| Rochester | Livingston, Monroe, Ontario, Orleans, and Wayne counties |
| Syracuse | Madison, Onondaga, and Oswego counties |
| Utica | Herkimer and Oneida counties |
| Balance of state | Allegany, Cattaraugus, Cayuga, Chautauqua, Chenango, Clinton, Columbia, Cortland, Delaware, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Otsego, Putnam, Rockland, St. Lawrence, Schoharie, Schuyler, Seneca, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Westchester, Wyoming, and Yates counties. |

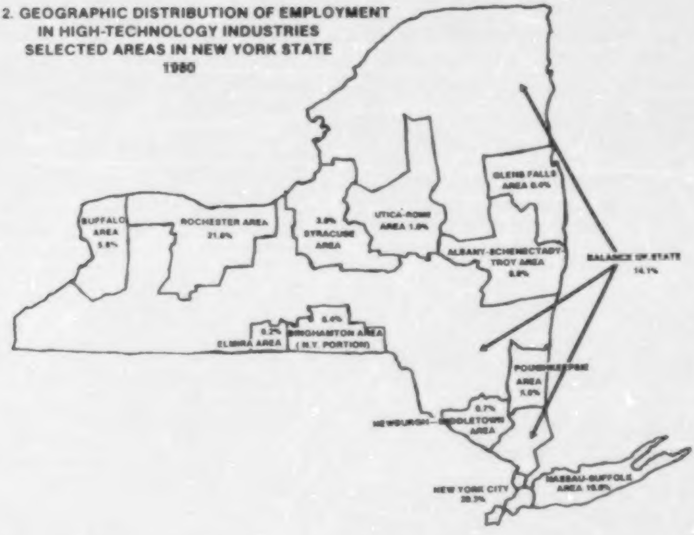
In the Binghamton area (New York portion), high-technology employment is concentrated in three industries: electronic computing equipment (SIC 3573), radio and TV communication equipment (SIC 3662), and photographic equipment and supplies (SIC 3861). Nearly all high-technology jobs in the Poughkeepsie area were in the electronic computing equipment (SIC 3573) or the semiconductors and related devices (SIC 3674) fields. In the Rochester area, photographic equipment and supplies (SIC 3861) accounted for nearly eight of every 10 high-technology jobs. The next largest industries in this area were radio and TV communication equipment (SIC 3662) and process control instruments (SIC 3823).

As shown in Table 9 and Map 1, employment in high-technology industries as a percent of labor force in the other 10 areas ranged from 0.9 percent in Albany-Schenectady-Troy to 6.0 percent in Nassau-Suffolk. It should be noted that the percentage reported for the Albany-Schenectady-Troy area is small mainly because the General Electric installations in the area were not included among high-technology industries with long-term growth potential.

Map 1. EMPLOYMENT IN HIGH-TECHNOLOGY INDUSTRIES AS A PERCENT OF LABOR FORCE SELECTED AREAS IN NEW YORK STATE 1980


BUFFALO AREA 4.1%
ROCHESTER AREA 10.0%
4.1% SYRACUSE AREA
UTICA-ROME AREA 5.4%
3.3% GLENS FALLS AREA
ALBANY-SCHENECTADY-TROY AREA 5.8%
BALANCE OF STATE 4.2%
21.0% BINGHAMTON AREA (N.Y. PORTION)
2.2% ELMIRA AREA
POUGHKEEPSIE AREA 21.0%
NEWBURGH-MIDDLETOWN AREA 2.8%
NEW YORK CITY 2.7%
NASSAU-SUFFOLK AREA 8.0%

Map 2. GEOGRAPHIC DISTRIBUTION OF EMPLOYMENT IN HIGH-TECHNOLOGY INDUSTRIES SELECTED AREAS IN NEW YORK STATE 1980

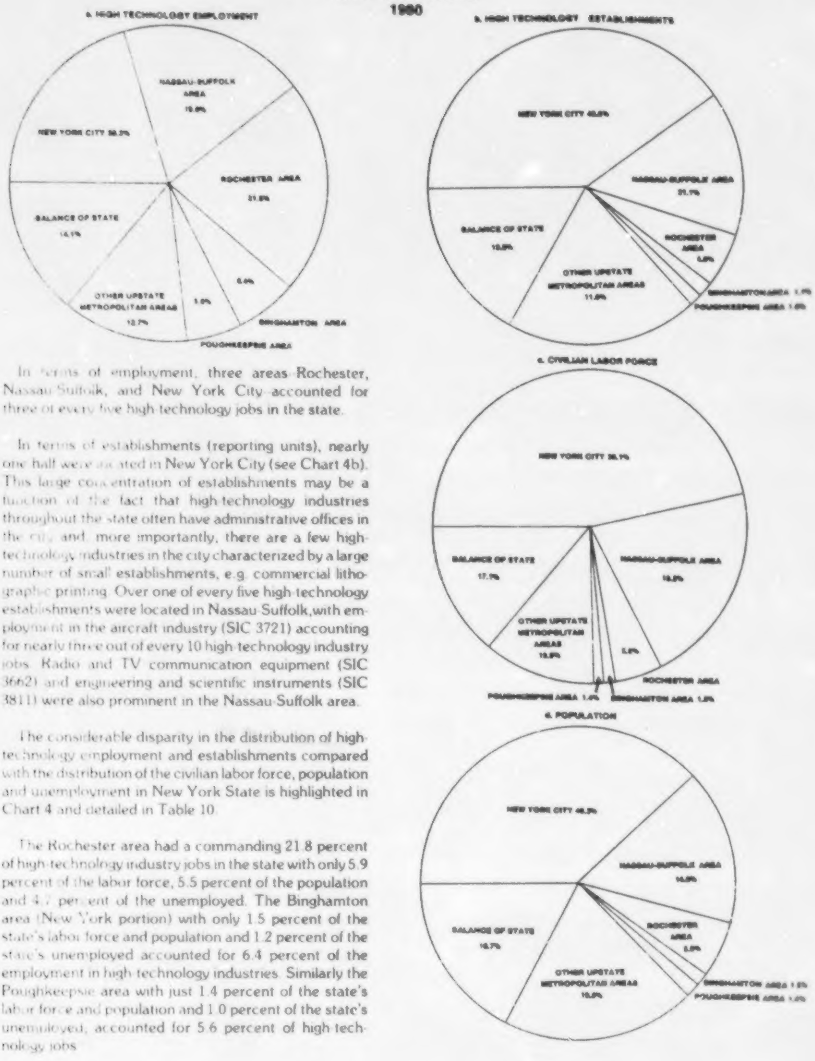

BUFFALO AREA 5.8%
ROCHESTER AREA 21.8%
3.8% SYRACUSE AREA
UTICA-ROME AREA 1.8%
GLENS FALLS AREA 0.4%
ALBANY-SCHENECTADY-TROY AREA 8.8%
BALANCE OF STATE 14.1%
8.4% BINGHAMTON AREA (N.Y. PORTION)
0.2% ELMIRA AREA
POUGHKEEPSIE AREA 5.8%
0.7% NEWBURGH-MIDDLETOWN AREA
NEW YORK CITY 28.3%
NASSAU-SUFFOLK AREA 10.8%

With the exception of New York City, areas with large number of jobs in high technology industries (Rochester and Nassau-Suffolk) had lower unemployment rates than did the state as a whole in 1980. Areas with many high-technology jobs per capita, e.g. Binghamton, Poughkeepsie and Rochester, also had a lower jobless rate in 1980. These relationships have held over the years (see Table 9).

Table 9. EMPLOYMENT IN HIGH TECHNOLOGY INDUSTRIES AS A PERCENT OF LABOR FORCE, NUMBER OF HIGH TECHNOLOGY JOBS PER 1,000 POPULATION AND UNEMPLOYMENT RATES, NEW YORK STATE AND SELECTED AREAS
1980

| Area | Employment in high technology as percent of labor force | Number of jobs in high-technology industries per 1,000 population | Unemployment rate |
|---|---|---|---|
| Binghamton (N.Y. portion) | 21.6 | 99 | 6.1 |
| Poughkeepsie | 21.4 | 94 | 5.3 |
| Rochester | 19.0 | 92 | 6.0 |
| Nassau-Suffolk | 6.0 | 30 | 6.0 |
| Utica | 5.4 | 23 | 7.4 |
| NEW YORK STATE | 5.1 | 23 | 7.5 |
| Balance of state | 4.2 | 20 | 6.6 |
| Buffalo | 4.1 | 19 | 9.7 |
| Syracuse | 4.1 | 19 | 7.3 |
| Glens Falls | 3.3 | 15 | 8.8 |
| Newburgh-Middletown | 2.8 | 12 | 7.7 |
| New York City (5 county) | 2.7 | 12 | 8.6 |
| Elmira | 2.2 | 9 | 7.7 |
| Albany-Schenectady-Troy | 0.9 | 4 | 5.8 |

Chart 4. PERCENT DISTRIBUTION
NEW YORK STATE
1980



In terms of employment, three areas Rochester, Nassau-Suffolk, and New York City accounted for three of every five high-technology jobs in the state.

In terms of establishments (reporting units), nearly one half were located in New York City (see Chart 4b). This large concentration of establishments may be a function of the fact that high-technology industries throughout the state often have administrative offices in the city and, more importantly, there are a few high-technology industries in the city characterized by a large number of small establishments, e.g. commercial lithographic printing. Over one of every five high-technology establishments were located in Nassau-Suffolk, with employment in the aircraft industry (SIC 3721) accounting for nearly three out of every 10 high-technology industry jobs. Radio and TV communication equipment (SIC 3662) and engineering and scientific instruments (SIC 3811) were also prominent in the Nassau-Suffolk area.

The considerable disparity in the distribution of high-technology employment and establishments compared with the distribution of the civilian labor force, population and unemployment in New York State is highlighted in Chart 4 and detailed in Table 10.

The Rochester area had a commanding 21.8 percent of high-technology industry jobs in the state with only 5.9 percent of the labor force, 5.5 percent of the population and 4.7 percent of the unemployed. The Binghamton area (New York portion) with only 1.5 percent of the state's labor force and population and 1.2 percent of the state's unemployed accounted for 6.4 percent of the employment in high-technology industries. Similarly the Poughkeepsie area with just 1.4 percent of the state's labor force and population and 1.0 percent of the state's unemployed, accounted for 5.6 percent of high-technology jobs.

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Table 10. DISTRIBUTION OF HIGH TECHNOLOGY ESTABLISHMENTS, HIGH TECHNOLOGY EMPLOYMENT, CIVILIAN LABOR FORCE, POPULATION AND UNEMPLOYMENT
NEW YORK STATE, 1980
(Percent)

| Area | Reporting establishments | High-technology employment | Civilian labor force | Population | Unemployment |
|---|---|---|---|---|---|
| New York State | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| New York City | 46.6 | 20.3 | 38.1 | 40.3 | 43.9 |
| Albany-Schenectady-Troy | 2.2 | 0.8 | 4.7 | 4.5 | 3.7 |
| Binghamton (N.Y. portion) | 1.1 | 6.4 | 1.5 | 1.5 | 1.2 |
| Buffalo | 4.9 | 5.8 | 7.2 | 7.1 | 9.3 |
| Elmira | 0.1 | 0.2 | 0.5 | 0.6 | 0.5 |
| Glens Falls | 0.3 | 0.4 | 0.6 | 0.6 | 0.7 |
| Nassau-Suffolk | 21.1 | 19.0 | 16.2 | 14.8 | 12.9 |
| Newburgh-Middletown | 0.8 | 0.7 | 1.4 | 1.5 | 1.4 |
| Poughkeepsie | 1.0 | 5.6 | 1.4 | 1.4 | 1.0 |
| Rochester | 4.8 | 21.8 | 5.9 | 5.5 | 4.7 |
| Syracuse | 2.2 | 3.0 | 3.8 | 3.7 | 3.7 |
| Utica | 1.2 | 1.8 | 1.7 | 1.8 | 1.7 |
| Balance of state | 13.8 | 14.1 | 17.1 | 16.7 | 15.3 |

Regardless of the number of high-technology jobs in an area, these jobs are concentrated in a limited number of industries. For example, in the Binghamton, Poughkeepsie, and Rochester areas, where about one-fifth of the labor force work in high-technology industries, at least 80 percent of the high-technology employees work in three industries (see Table 11). Even in the Buffalo area, which accounted for only 5.8 percent of the jobs in high-technology industries in the state, three industries employed over 40 percent of these workers. It would appear, therefore, that dominance of one or more high-technology industries and low unemployment rates go hand in hand in New York State.

Table 11. EMPLOYMENT AND NUMBER OF ESTABLISHMENTS OF THREE LARGEST HIGH-TECHNOLOGY INDUSTRIES, NEW YORK STATE AND SELECTED AREAS, 1980

| SIC code | Area and industry | Portion of high-technology employment in area | | Number of reporting establishments |
|---|---|---|---|---|
| | | Number | Percent | |
| | **New York State** | | | |
| 3861 | Photographic equipment and supplies | | | 127 |
| 3573 | Electronic computing equipment | | | 83 |
| 3662 | Radio and TV communication equipment | | | 213 |
| | Total | 165,800 | 40.7 | 423 |
| | **New York City** | | | |
| 2721 | Periodicals | | | 532 |
| 2752 | Commercial lithographic printing | | | 992 |
| 2844 | Toilet preparations | | | 70 |
| | Total | 42,500 | 51.3 | 1,594 |
| | **Albany-Schenectady-Troy** | | | |
| 2752 | Commercial lithographic printing | | | 52 |
| 3825 | Instruments to measure electricity | | | 3 |
| 2833 | Medicinals and botanicals | | | 1 |
| | Total | 1,900 | 58.0 | 55 |
| | **Binghamton (New York portion)** | | | |
| 3573 | Electronic computing equipment | | | 3 |
| 3662 | Radio and TV communication equipment | | | 4 |
| 3861 | Photographic equipment and supplies | | | 7 |
| | Total | 21,000 | 80.2 | 14 |
| | **Buffalo** | | | |
| 2869 | Industrial organic chemicals, n.e.c. | | | 12 |
| 3465 | Automotive stampings | | | 1 |
| 3622 | Industrial controls | | | 11 |
| | Total | 9,700 | 41.1 | 24 |
| | **Elmira** | | | |
| 3721 | Aircraft | | | 1 |
| 3662 | Radio and TV communication equipment | | | 1 |
| 3569 | General industrial machinery, n.e.c. | | | 1 |
| | Total | 800 | 83.0 | 3 |
| | **Glens Falls** | | | |
| 3841 | Surgical and medical instruments | | | 5 |
| 2752 | Commercial lithographic printing | | | 5 |
| 2869 | Industrial inorganic chemicals, n.e.c. | | | 1 |
| | Total | n.d. | 98.9 | 11 |

Table 11. EMPLOYMENT AND NUMBER OF ESTABLISHMENTS OF THREE LARGEST HIGH TECHNOLOGY INDUSTRIES, NEW YORK STATE AND SELECTED AREAS–Continued

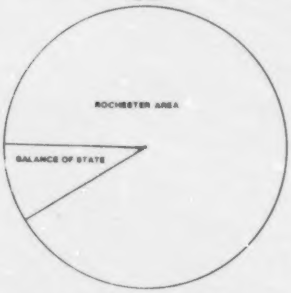
| SIC code | Area and industry | Portion of high-technology employment in area | | Number of reporting establishments |
|---|---|---|---|---|
| | | Number | Percent | |
| | **Nassau-Suffolk** | | | |
| 3721 | Aircraft | | | 3 |
| 3662 | Radio and TV communication equipment | | | 90 |
| 3811 | Engineering and scientific instruments | | | 36 |
| | Total | 42,600 | 54.9 | 129 |
| | **Newburgh-Middletown** | | | |
| 2844 | Toilet preparations | | | 4 |
| 2869 | Industrial organic chemicals, n.e.c. | | | 3 |
| 3715 | Truck trailers | | | 3 |
| | Total | 1,800 | 59.3 | 10 |
| | **Poughkeepsie** | | | |
| 3573 | Electronic computing equipment | | | 6 |
| 3674 | Semiconductors and related devices | | | 4 |
| 3679 | Electronic components, n.e.c. | | | 7 |
| | Total | n.d. | 95.7 | 17 |
| | **Rochester** | | | |
| 3861 | Photographic equipment and supplies | | | 27 |
| 3662 | Radio and TV communication equipment | | | 13 |
| 3823 | Process control instruments | | | 4 |
| | Total | n.d. | 87.8 | 44 |
| | **Syracuse** | | | |
| 3622 | Radio and TV communication equipment | | | 12 |
| 3644 | Noncurrent carrying wiring devices | | | 1 |
| 3841 | Surgical and medical instruments | | | 4 |
| | Total | 9,100 | 73.3 | 17 |
| | **Utica** | | | |
| 3662 | Radio and TV communication equipment | | | 2 |
| 3573 | Electronic computing equipment | | | 4 |
| 3679 | Electronic components, n.e.c. | | | 4 |
| | Total | 5,300 | 72.3 | 10 |

n.d. Not disclosable.

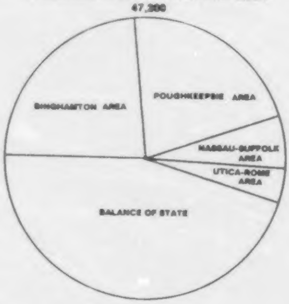
By far, most of the jobs in the largest high technology industry in the state, (photographic equipment and supplies), were in the Rochester area. The second largest industry, electronic computing equipment, was not concentrated in any one single area but many of the jobs in the industry were in the Binghamton (N.Y. portion) and Poughkeepsie areas. The largest single location was Nassau-Suffolk for the state's third largest high-technology industry, radio and TV communication equipment. The Syracuse, Rochester and Utica-Rome areas and New York City also had substantial employment in the industry. Periodicals, the fourth largest high-technology industry, was concentrated in New York City. Commercial lithographic printing, the fifth largest, was also concentrated in New York City, but not to the same extent. Nearly all jobs in the ailing aircraft industry, sixth largest, were in Nassau-Suffolk. The geographic distribution of all 52 high-technology industries that are considered to have a high potential for growth and development in New York State is shown in Table 12. Areas are listed by employment within each industry, largest first. □

Chart 5. EMPLOYMENT OF SELECTED HIGH-TECHNOLOGY INDUSTRIES
NEW YORK STATE, 1980

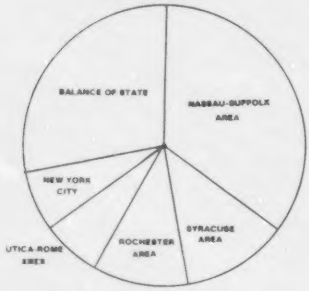
a. PHOTOGRAPHIC EQUIPMENT AND SUPPLIES
78,100



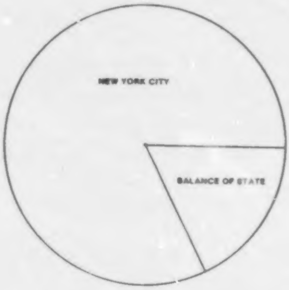
b. ELECTRONIC COMPUTING EQUIPMENT
47,200



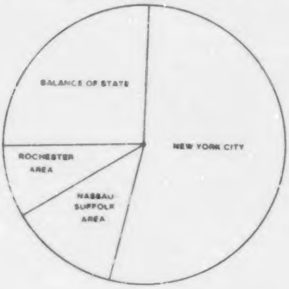
c. RADIO AND TV COMMUNICATION EQUIPMENT
40,500



d. PERIODICALS
24,800



e. COMMERCIAL LITHOGRAPHIC PRINTING
25,500



f. AIRCRAFT
22,700

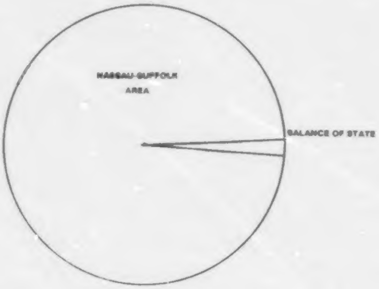


Table 12. GEOGRAPHIC CONCENTRATION OF REPORTING ESTABLISHMENTS AND WORKERS IN HIGH TECHNOLOGY INDUSTRIES, NEW YORK STATE, 1980

| SIC code | Industry and area | Reporting establishments | Statewide employment |
|---|---|---|---|
| 3861 | Photographic equipment and supplies | 83 | 78,100 |
| | Rochester | 27 | |
| | Nassau-Suffolk | 32 | |
| | Binghamton (N.Y. portion) | 7 | |
| | New York City | 39 | |
| 3573 | Electronic computing equipment | 83 | 47,200 |
| | Binghamton (N.Y. portion) | 3 | |
| | Poughkeepsie | 6 | |
| | Nassau-Suffolk | 27 | |
| | Utica | 4 | |
| 3662 | Radio and TV communication equipment | 213 | 40,500 |
| | Nassau-Suffolk | 90 | |
| | Syracuse | 12 | |
| | Rochester | 13 | |
| | Utica | 2 | |
| | New York City | 41 | |
| 2721 | Periodicals | 711 | 26,800 |
| | New York City | 532 | |
| 2752 | Commercial lithographic printing | 1,811 | 25,500 |
| | New York City | 992 | |
| | Nassau-Suffolk | 296 | |
| | Rochester | 82 | |
| 3721 | Aircraft | 5 | 22,700 |
| | Nassau-Suffolk | 3 | |
| | Elmira | 1 | |
| 3674 | Semiconductors and related devices | 45 | 15,300 |
| | Poughkeepsie | 4 | |
| | Nassau-Suffolk | 21 | |
| 3679 | Electronic components, n.e.c. | 236 | 14,200 |
| | Nassau-Suffolk | 92 | |
| | Binghamton (N.Y. portion) | 14 | |
| | New York City | 51 | |
| | Rochester | 17 | |
| 3643 | Current-carrying wiring devices | 57 | 12,800 |
| | New York City | 24 | |
| | Nassau-Suffolk | 17 | |
| 2844 | Toilet preparations | 109 | 11,800 |
| | New York City | 70 | |
| | Nassau-Suffolk | 20 | |
| | Newburgh-Middletown | 4 | |
| 3811 | Engineering and scientific instruments | 78 | 11,300 |
| | Nassau-Suffolk | 36 | |
| | Binghamton (N.Y. portion) | 1 | |

Table 12 GEOGRAPHIC CONCENTRATION OF REPORTING ESTABLISHMENTS AND WORKERS IN HIGH TECHNOLOGY INDUSTRIES, NEW YORK STATE–Continued

| SIC code | Industry and area | Reporting establishments | Statewide employment |
|---|---|---|---|
| 2869 | Industrial organic chemicals, n.e.c. | 52 | 9,500 |
| | New York City | 13 | |
| | Buffalo | 12 | |
| 3841 | Surgical and medical instruments | 71 | 6,400 |
| | Glens Falls | 5 | |
| | Syracuse | 4 | |
| 3842 | Surgical appliances and supplies | 120 | 5,100 |
| | New York City | 17 | |
| | Nassau Suffolk | 28 | |
| | Buffalo | 10 | |
| 3569 | General industrial machinery, n.e.c. | 75 | 5,000 |
| | Buffalo | 5 | |
| 3661 | Telephone and telegraph apparatus | 28 | 5,000 |
| | New York City | 9 | |
| 2819 | Industrial inorganic chemicals, n.e.c. | 40 | 4,700 |
| | New York City | 12 | |
| 3559 | Special industry machinery, n.e.c. | 81 | 4,300 |
| | Rochester | 10 | |
| | Binghamton (N.Y. portion) | 2 | |
| 3644 | Noncurrent carrying wiring devices | 22 | 4,200 |
| | Syracuse | 1 | |
| 7372 | Computer programming and software | 314 | 4,200 |
| | New York City | 139 | |
| 3652 | Phonograph records, video apparatus | 138 | 4,100 |
| | New York City | 103 | |
| | Nassau Suffolk | 15 | |
| 3823 | Process control instruments | 35 | 3,900 |
| | Rochester | 4 | |
| | Buffalo | 4 | |
| 3622 | Industrial controls | 42 | 3,900 |
| | Buffalo | 11 | |
| | Syracuse | 6 | |
| | Nassau Suffolk | 7 | |
| 3645 | Residential lighting fixtures | 145 | 3,900 |
| | New York City | 87 | |
| | Nassau Suffolk | 32 | |
| 3825 | Instruments to measure electricity | 50 | 3,600 |
| | Nassau Suffolk | 32 | |
| | Albany Schenectady Troy | 3 | |

Table 12 GEOGRAPHIC CONCENTRATION OF REPORTING ESTABLISHMENTS AND WORKERS IN HIGH TECHNOLOGY INDUSTRIES, NEW YORK STATE—Continued

| SIC code | Industry and area | Reporting establishments | Statewide employment |
|---|---|---|---|
| 3465 | Automotive stampings | 6 | 3,500 |
| | Buffalo | 1 | |
| | Utica | 1 | |
| 3829 | Measuring and controlling devices, n.e.c. | 54 | 2,900 |
| | Nassau Suffolk | 18 | |
| | New York City | 14 | |
| 3613 | Switchgear and switchboard apparatus | 47 | 2,700 |
| | Nassau Suffolk | 12 | |
| 3832 | Optical instruments and lenses | 65 | 2,700 |
| | Buffalo | 2 | |
| | Nassau Suffolk | 23 | |
| | Rochester | 10 | |
| | Newburgh Middletown | 3 | |
| | New York City | 13 | |
| 3551 | Food products machinery | 71 | 2,600 |
| | New York City | 25 | |
| | Buffalo | 12 | |
| | Rochester | 6 | |
| | Nassau Suffolk | 12 | |
| 3579 | Office machines, n.e.c. | 24 | 2,000 |
| | New York City | 10 | |
| 3843 | Dental equipment and supplies | 37 | 2,000 |
| | New York City | 17 | |
| | Rochester | 1 | |
| | Buffalo | 5 | |
| | Nassau Suffolk | 11 | |
| 3764 | Space propulsion units and parts | 3 | 1,700 |
| | Buffalo | 1 | |
| 3531 | Construction machinery | 27 | 1,600 |
| | Utica | 2 | |
| | Rochester | 4 | |
| 3693 | X-ray apparatus and electromedical equipment | 19 | 1,600 |
| | Buffalo | 1 | |
| | Nassau Suffolk | 8 | |
| | Syracuse | 1 | |
| 3641 | Electric lamps | 15 | 1,300 |
| | New York City | 5 | |
| 3822 | Environmental controls | 23 | 1,100 |
| | Nassau Suffolk | 10 | |
| | Rochester | 2 | |
| | Utica | 1 | |

Table 12 GEOGRAPHIC CONCENTRATION OF REPORTING ESTABLISHMENTS AND WORKERS IN HIGH-TECHNOLOGY INDUSTRIES, NEW YORK STATE--Continued

| SIC code | Industry and area | Reporting establishments | Statewide employment |
|---|---|---|---|
| 2833 | Medicinals and botanicals | 12 | 800 |
| | Albany-Schenectady-Troy | 1 | |
| | Newburgh-Middletown | 1 | |
| 3678 | Electronic connectors | 5 | 800 |
| | New York City | 2 | |
| 3692 | Primary batteries, dry and wet | 6 | 800 |
| | Buffalo | 1 | |
| 3713 | Truck and bus bodies | 27 | 800 |
| | New York City | 9 | |
| | Nassau-Suffolk | 3 | |
| | Buffalo | 5 | |
| 2891 | Adhesives and sealants | 40 | 700 |
| | New York City | 20 | |
| | Nassau-Suffolk | 7 | |
| | Buffalo | 5 | |
| 3647 | Vehicular lighting equipment | 9 | 700 |
| | Syracuse | 2 | |
| 2831 | Biological products | 14 | 700 |
| | Buffalo | 3 | |
| | Nassau-Suffolk | 2 | |
| 2879 | Agricultural chemicals, n.e.c. | 18 | 600 |
| | Buffalo | 2 | |
| | Rochester | 2 | |
| | New York City | 7 | |
| 3576 | Scales and balances, except laboratory | 5 | 600 |
| | New York City | 2 | |
| 3623 | Welding apparatus, electric | 6 | 500 |
| | New York City | 4 | |
| 3715 | Truck trailers | 6 | 500 |
| | Newburgh-Middletown | 2 | |
| 3466 | Crowns and closures | 4 | 400 |
| | New York City | 4 | |
| 3824 | Fluid meters and counting devices | 12 | 300 |
| | Nassau-Suffolk | 5 | |
| 3532 | Mining machinery | 5 | 100 |
| 3769 | Space vehicle equipment, n.e.c. | 7 | 100 |

## Appendix A

| SIC Code | Industry Title and Definition |
|---|---|
| 2721 | **Periodicals: Publishing, Publishing and Printing**<br>Establishments primarily engaged in publishing periodicals, or in preparing, publishing, and printing periodicals. These establishments carry on the various operations necessary for issuing periodicals, but may or may not perform their own printing. |
| 2752 | **Commercial Printing, Lithographic**<br>Establishments primarily engaged in printing by the lithographic process. The greater part of the work in this industry is performed on a job or custom basis; but in some cases lithographed calendars, maps, posters, decalcomanias, etc., are made for sale. Offset printing, photo-offset printing, and photolithographing are also included in this industry. |
| 2819 | **Industrial Inorganic Chemicals, Not Elsewhere Classified**<br>Establishments primarily engaged in manufacturing industrial chemicals, not elsewhere classified. Important products of this industry include inorganic salts of sodium (excluding refined sodium chloride), potassium, aluminum, calcium, chromium, magnesium, mercury, nickel, silver, tin; inorganic compounds such as alums, calcium carbide, hydrogen peroxide, sodium silicate, ammonia compounds (except fertilizers), rare earth metal salts and elemental bromine, fluorine, iodine, phosphorus, and alkali metals (sodium, potassium, lithium, etc.). |
| 2831 | **Biological Products**<br>Establishments primarily engaged in the production of bacterial and virus vaccine, toxoids and analogous products (such as allergenic extracts), serums, plasmas, and other blood derivatives for human or veterinary use. |
| 2833 | **Medicinal Chemicals and Botanical Products**<br>Establishments primarily engaged in (1) manufacturing bulk organic and inorganic medicinal chemicals and their derivatives; and (2) processing (grading, grinding, and milling) bulk botanical drugs and herbs. Establishments primarily engaged in manufacturing or isolating basic vitamins and isolating active medicinal principals such as alkoloids from botanical drugs and herbs are also included in this industry. |
| 2844 | **Perfumes, Cosmetics, and Other Toilet Preparations**<br>Establishments primarily engaged in manufacturing perfumes (natural and synthetic), cosmetics, and other toilet preparations. This industry also includes establishments primarily engaged in blending and compounding perfume bases; and those manufacturing shampoos and shaving products, whether from soap or synthetic detergents. |
| 2869 | **Industrial Organic Chemicals, Not Elsewhere Classified**<br>Establishments primarily engaged in manufacturing industrial organic chemicals, not elsewhere classified. Important products of this industry include: (1) noncyclic organic chemicals such as acetic, chloroacetic, adipic, formic, oxalic and tartaric acids and their metallic salts; chloral, formaldehyde and methylamine; (2) solvents such as amyl, butyl, and ethyl alcohols; methanol, amyle, butyle acetates; ethel ether, ethylene glycol ether and diethylene glycol ether, acetone, carbon disulfide and chlorinated |

SIC Code | **Industry Title and Definition**

**Industrial Organic Chemicals, Not Elsewhere Classified (continued)**

solvents such as carbon tetrachloride, perchloroethylene and trichloroethylene; (3) polyhydric alcohols such as ethylene glycol, sorbitol, pentaerythritol, synthetic glycerin, (4) synthetic perfume and flavoring materials such as coumarin, methyl salicylate, saccharine, citral, citronellal, synthetic geraniol, ionone terpineol, and synthetic vanillin, (5) rubber processing chemicals such as accelerators and antioxidants, both cyclic and acyclic; (6) plasticizers, both cyclic and acyclic, such as esters of phosphoric acid, phthalic anhydride, adipic acid, lauric acid, oleic acid, sebacic acid, and stearic acid; (7) synthetic tanning agents such as naphthalene sulfonic acid condensates; (8) chemical warfare gases, and (9) esters, amines, etc. of polyhydric alcohols and fatty and other acids.

2879 **Pesticides and Agricultural Chemicals, Not Elsewhere Classified**

Establishments primarily engaged in the formulation and preparation of ready-to-use agricultural and household pest control chemicals, including insecticides, fungicides and herbicides from technical chemicals or concentrates; and the production of concentrates which require further processing before use as agricultural pesticides. This industry also includes establishments primarily engaged in manufacturing or formulating agricultural chemicals, not elsewhere classified, such as minor or trace elements and soil conditioners.

2891 **Adhesives and Sealants**

Establishments primarily engaged in manufacturing industrial and household adhesives, glues, calking components, sealants, and linoleum, tile, and rubber cements from vegetable, animal, or synthetic plastics materials, purchased or produced in the same establishment.

3465 **Automotive Stampings**

Establishments primarily engaged in manufacturing automotive stampings, such as body parts, hubs and trim.

3466 **Crowns and Closures**

Establishments primarily engaged in manufacturing bottle caps, metal jar crowns and tops.

3531 **Construction Machinery and Equipment**

Establishments primarily engaged in manufacturing heavy machinery and equipment used by the construction industries, such as bulldozers; concrete mixers; cranes, except industrial plant type; dredging machinery; pavers; and power shovels.

3532 **Mining Machinery and Equipment, Except Oil Field Machinery and Equipment**

Establishments primarily engaged in manufacturing heavy machinery and equipment used by the mining industries, such as coal breakers, mine cars, mineral cleaning machinery, concentration machinery, core drills, coal cutters, portable rock drills, and rock crushing machinery.

3551 **Food Products Machinery**

Establishments primarily engaged in manufacturing machinery for use by the food products and beverage manufacturing industries in the preparation, canning, or packaging of food products; and parts and attachments for such machinery.

| SIC Code | Industry Title and Definition |
|---|---|
| 3559 | **Special Industry Machinery, Not Elsewhere Classified**<br>Establishments primarily engaged in manufacturing special industry machinery, not elsewhere classified, such as smelting and refining equipment, cement making, clay working, cotton ginning, glass making, hat making, incandescent lamp making, leather working, paint making, rubber working, cigar and cigarette making, tobacco working, shoe making, and stone working machinery. |
| 3569 | **General Industrial Machinery and Equipment, Not Elsewhere Classified**<br>Establishments primarily engaged in manufacturing machinery, equipment, and components for general industrial use, and for which no special classification is provided in the *Standard Industrial Classification Manual*. |
| 3573 | **Electronic Computing Equipment**<br>Establishments primarily engaged in manufacturing electronic computers and peripheral equipment and/or major logical components intended for use in electronic computer systems. Included are general-purpose electronic analog computers, electronic digital computers, military, ruggedized, and special purpose computers. The electronic computers may be used for data processing or may be incorporated as components of control equipment for industrial use, and as components of equipment used in weapons and weapons systems, space and oceanographic exploration, transportation and other systems. Electronic computer systems contain high speed arithmetic and program control units, on-line information storage devices, input/output equipment, terminals, data communication devices, and punched card equipment. Examples of input/output equipment are converters (card and/or tape), readers and printers. Examples of storage devices are magnetic drums and disks, magnetic cores and magnetic film memories. In addition to providing technical manuals necessary for the operation and maintenance of the equipment, establishments in this industry usually furnish general-purpose computer programs and basic operating systems programs needed for effective use of the computer system. Establishments primarily producing rebuilt electronic computers are also included in this industry. |
| 3576 | **Scales and Balances, Except Laboratory**<br>Establishments primarily engaged in manufacturing weighing and force measuring machines and devices of all types, except those regarded as scientific apparatus for laboratory and experimental work. |
| 3579 | **Office Machines, Not Elsewhere Classified**<br>Establishment primarily engaged in manufacturing office machines and devices, not elsewhere classified in the *Standard Industrial Classification Manual*. |
| 3613 | **Switchgear and Switchboard Apparatus**<br>Establishments primarily engaged in manufacturing switchgear and switchboard apparatus. Important products of this industry include power switches, circuit breakers, power switching equipment, and similar switchgear for general industrial application; switchboards and cubicles, control and metering panels, power fuse mountings, and similar switchboard apparatus and supplies. |
| 3622 | **Industrial Controls**<br>Establishments primarily engaged in manufacturing motor starters and controllers, control accessories, electronic controls, and other industrial controls. |

**SIC Code** **Industry Title and Definition**

**3623** **Welding Apparatus, Electric**

Establishments primarily engaged in manufacturing electric welding apparatus and accessories. Establishments primarily engaged in coating welding wire from purchased wire or from wire drawn in the same establishment are also included.

**3641** **Electric Lamps**

Establishments primarily engaged in manufacturing electric bulbs, tubes, and related light sources. Important products of this industry include incandescent filament lamps, vapor and fluorescent lamps, photoflash and photoflood lamps, electrotherapeutic lamp units for ultra-violet and infra-red radiation, and other electric light sources.

**3643** **Current-Carrying Wiring Devices**

Establishments primarily engaged in manufacturing current-carrying wiring devices. Important products of this industry include attachment plugs and caps, convenience outlets, lamp sockets and receptacles, snap switches, conductor connectors, overhead trolley line material, rail bonds for both propulsion and signal circuits, lightning arrestors, and other lightning protective equipment.

**3644** **Noncurrent-Carrying Wiring Devices**

Establishments primarily engaged in manufacturing noncurrent-carrying wiring devices. Important products of this industry include conduits and fittings; electrical insulators and insulation materials, except porcelain insulators and glass insulators; outlet, switch and fuse boxes; and pole line hardware.

**3645** **Residential Electric Lighting Fixtures**

Establishments primarily engaged in manufacturing residential electric lighting fixtures and equipment, fixed or portable.

**3647** **Vehicular Lighting Equipment**

Establishments primarily engaged in manufacturing vehicular lighting equipment.

**3652** **Phonograph Records and Pre-recorded Magnetic Tape**

Establishments primarily engaged in manufacturing phonograph records and pre-recorded magnetic tape.

**3661** **Telephone and Telegraph Apparatus**

Establishments primarily engaged in manufacturing wire telephone and telegraph equipment, and parts especially designed for telephone and telegraph use.

**3662** **Radio and Television Transmitting, Signaling, and Detection Equipment and Apparatus**

Establishments primarily engaged in manufacturing (1) radio and television broadcasting equipment; (2) electric communications equipment and parts, except telephone and telegraph; (3) electronic field detection apparatus, light and heat emission operating apparatus, object detection apparatus and navigational electronic equipment, and aircraft and missile control systems; and (4) high energy particle accelerator systems and equipment designed and sold as a complete package for radiation therapy, irradiation, radiographic inspection, and research (linear accelerators, betatrons, dynamotrons, Vander

**SIC Code** | **Industry Title and Definition**

### Radio and Television Transmitting, Signaling, and Detection Equipment and Apparatus (continued)

graff generators, resonant transformers, insulating core transformers, etc.); (5) high energy particle electronic equipment and accessories sold separately for the construction of linear accelerators, cyclotrons, synchrotrons, and other high energy research installations (transmitters/modulators, accelerating waveguide structures, pulsed electron guns, vacuum systems, cooling systems, etc.); (6) other electric and electronic communication and signaling products, not elsewhere classified.

### 3674 Semiconductors and Related Devices

Establishments primarily engaged in manufacturing semiconductors and related solid state devices, such as semiconductor diodes and stacks, including rectifiers, integrated microcircuits (semiconductor networks), transistors, solar cells, and light sensing and emitting semiconductor (solid state) devices.

### 3678 Connectors for Electronic Applications

Establishments primarily engaged in manufacturing electronic connectors.

### 3679 Electronic Components, Not Elsewhere Classified

Establishments primarily engaged in manufacturing electronic components, not elsewhere clasified, such as receiving antennas, printed circuits, switches, and waveguides.

### 3692 Primary Batteries, Dry and Wet

Establishments primarily engaged in manufacturing primary batteries, dry or wet.

### 3693 Radiographic X-ray, Fluoroscopic X-ray, Therapeutic X-ray, and Other X-ray Apparatus and Tubes; Electromedical and Electrotherapeutic Apparatus

Establishments primarily engaged in manufacturing radiographic X-ray, fluoroscopic X-ray, and therapeutic X-ray apparatus and tubes for medical, industrial, research and control applications. This industry also includes establishments primarily engaged in manufacturing electromedical and electrotherapeutic apparatus except electrotherapeutic lamp units for ultra-violet and infra-red radiation.

### 3713 Truck and Bus Bodies

Establishments primarily engaged in manufacturing truck and bus bodies, for sale separately or for assembly on purchased chassis.

### 3715 Truck Trailers

Establishments primarily engaged in manufacturing truck trailers, truck trailer chassis for sale separately, detachable trailer bodies (cargo containers) for sale separately, and detachable trailer (cargo container) chassis, for sale separately.

### 3721 Aircraft

Establishments primarily engaged in manufacturing or assembling complete aircraft. This industry also includes establishments primarily engaged in research and development on aircraft or in factory-type aircraft modification on a contract or fee basis.

| SIC Code | Industry Title and Definition |
|---|---|
| 3764 | **Guided Missile and Space Vehicle Propulsion Units and Propulsion Unit Parts**<br>Establishments primarily engaged in manufacturing guided missile propulsion units and propulsion unit parts. Research and development on guided missile and space vehicle propulsion units and propulsion unit parts is also included in this industry. |
| 3769 | **Guided Missile and Space Vehicle Parts and Auxiliary Equipment, Not Elsewhere Classified**<br>Establishments primarily engaged in manufacturing guided missile and space vehicle parts and auxiliary equipment, not elsewhere classified, is also included in this industry. |
| 3811 | **Engineering, Laboratory, Scientific, and Research Instruments and Associated Equipment**<br>Establishments primarily engaged in manufacturing engineering, laboratory, and scientific instruments, including nautical, navigational, aeronautical, surveying, and drafting equipment and instruments for laboratory work and scientific research (except optical instruments). |
| 3822 | **Automatic Controls for Regulating Residential and Commercial Environments and Appliances**<br>Establishments primarily engaged in manufacturing temperature and related controls for heating and air-conditioning installations and refrigeration applications, which are electrically, electronically, or pneumatically actuated, and which measure and control variables such as temperature and humidity; and automatic regulators used as components of household appliances. |
| 3823 | **Industrial Instruments for Measurement, Display, and Control of Process Variables; and Related Products**<br>Establishments primarily engaged in manufacturing industrial instruments and related products for measuring, displaying (indicating and/or recording), transmitting, and controlling process variables in manufacturing, energy conversion, and public service utilities. These instruments operate mechanically, pneumatically, electronically, or electrically to measure process variables such as temperature, humidity, pressure, vacuum, combustion, glow, level, viscosity, density, acidity, alkalinity, specific gravity, gas and liquid concentration, sequence, time interval, mechanical motion, and rotation. |
| 3824 | **Totalizing Fluid Meters and Counting Devices**<br>Establishments primarily engaged in manufacturing totalizing (registering) meters monitoring fluid flows, such as watermeters and gasmeters; and producers of mechanical and electromechanical counters and associated metering devices. |
| 3825 | **Instruments for Measuring and Testing of Electricity and Electrical Signals**<br>Establishments primarily engaged in manufacturing instruments for measuring the characteristics of electricity and electrical signals, such as voltmeters, ammeters, wattmeters, watt-hour meters, demand meters, and equipment for testing the electrical characteristics of electrical, radio, and communication circuits and of internal combustion engines. |
| 3829 | **Measuring and Controlling Devices, Not Elsewhere Classified**<br>Establishments primarily engaged in manufacturing measuring and controlling devices, not elsewhere classified, including testing instruments to determine the physical properties of materials, nuclear instruments, aircraft engine instruments, and liquid-in-glass and bimetal thermometers. |

| SIC Code | Industry Title and Definition |
|---|---|
| 3832 | **Optical Instruments and Lenses**<br>Establishments primarily engaged in manufacturing instruments that measure an optical property; apparatus except photographic that projects or magnifies such as binoculars, prisms, and lenses; optical sighting and fire control equipment; and related analytical instruments. |
| 3841 | **Surgical and Medical Instruments and Apparatus**<br>Establishments primarily engaged in manufacturing medical, surgical, ophthalmic, and veterinary instruments and apparatus. |
| 3842 | **Orthopedic, Prosthetic, and Surgical Appliances and Supplies**<br>Establishments primarily engaged in manufacturing orthopedic, prosthetic, and surgical appliances and supplies, arch supports, and other foot appliances; fracture appliances, elastic hosiery, abdominal supporters, braces, and trusses; bandages; surgical gauze and dressings; sutures; adhesive tapes and medicated plasters; and personal safety appliances and equipment. |
| 3843 | **Dental Equipment and Supplies**<br>Establishments primarily engaged in manufacturing artificial teeth, dental metals, alloys and amalgams, and a wide variety of equipment, instruments, and supplies used by dentists, dental laboratories, and dental colleges. |
| 3861 | **Photographic Equipment and Supplies**<br>Establishments primarily engaged in manufacturing (1) photographic apparatus, equipment, parts, attachments, and accessories, such as still and motion picture cameras and projection apparatus; photocopy and microfilm equipment; blueprinting and diazotype (white printing) apparatus and equipment; and other photographic equipment; and (2) sensitized film, paper, cloth, and plates, and prepared photographic chemicals for use therewith. |
| 7372 | **Computer Programming and Other Software Services**<br>Establishments primarily engaged in providing services in computer programming, systems design and analysis, and other computer "software". |

# Appendix B

## Technical Notes

### Source of Employment and Payroll Data for New York State

The employment and payroll data for New York State is compiled from quarterly contribution reports submitted by employers covered under the New York State Unemployment Insurance Law. For the industries surveyed, the employment levels are generally comparable to those developed under the Current Employment Statistics program.

### Employment Data for United States

The source of employment data for the United States is the Current Employment Statistics program, a joint effort of the cooperating state Employment Security Agencies and the Bureau of Labor Statistics. Data on employment are collected monthly from a sample of establishments in nonagricultural activities, including government.

### Industry Classification

Data on employment and wages are maintained according to the industrial classification of the reporting employer. This is in accordance with the *Standard Industrial Classification Manual*, 1972 Edition. It is a hierarchical system of four digits which can be aggregated by SIC at the three, two or one digit level.

### The Average Weekly Wage

Average weekly wages are gross weekly averages. Included are wages for full and part time work and for all grades and classes of wage and salary workers. Also included are overtime pay, vacation allowances, bonuses, paid sick leave and the cash value of goods and services received by workers. The payroll data are, therefore, good indicators of trends or relationships among industries rather than actual pay scales of the industries.

### Confidentiality

Data are not disclosed for any industry level within an ownership class consisting of fewer than three reporting units.

If there are three or more reporting units, data are also withheld for an industry level in which one unit accounts for 80 percent or more of that industry's employment.

## Appendix C

### PAYROLL OF HIGH-TECHNOLOGY INDUSTRIES
### NEW YORK STATE, 1980 AND 1975
(In millions)

| SIC code | Industry | Payroll | | Percent change |
|---|---|---|---|---|
| | | 1980 | 1975 | |
| 2721 | Periodicals | $625.8 | $374.3 | 67.2 |
| 2752 | Commercial lithographic printing | 488.1 | 307.6 | 58.7 |
| 2819 | Industrial inorganic chemicals, n.e.c. | 120.6 | 92.2 | 30.7 |
| 2831 | Biological products | 9.0 | 4.3 | 107.5 |
| 2833 | Medicinals and botanicals | 16.7 | 5.6 | 199.4 |
| 2844 | Toilet preparations | 289.0 | 159.1 | 81.7 |
| 2869 | Industrial organic chemicals, n.e.c. | 261.5 | 176.7 | 48.0 |
| 2879 | Agricultural chemicals, n.e.c. | 12.5 | 10.2 | 22.4 |
| 2891 | Adhesives and sealants | 13.3 | 7.7 | 71.6 |
| 3465 | Automotive stampings | 101.3 | 69.7 | 45.4 |
| 3466 | Crowns and closures | 6.7 | 0.9 | 631.3 |
| 3531 | Construction machinery | 28.2 | 20.6 | 37.3 |
| 3532 | Mining machinery | 1.4 | 0.9 | 58.3 |
| 3551 | Food products machinery | 45.5 | 29.4 | 54.6 |
| 3559 | Special industry machinery, n.e.c. | 77.4 | 50.7 | 52.7 |
| 3569 | General industrial machinery, n.e.c. | 101.1 | 61.5 | 64.5 |
| 3573 | Electronic computing equipment | 1,289.4 | 722.1 | 78.6 |
| 3576 | Scales and balances, except laboratory | 9.0 | 5.5 | 64.3 |
| 3579 | Office machines, n.e.c. | 24.9 | 20.3 | 22.7 |
| 3613 | Switchgear and switchboard apparatus | 40.0 | 21.6 | 84.9 |
| 3622 | Industrial controls | 77.9 | 44.1 | 76.6 |
| 3623 | Welding apparatus, n.e.c. | 11.2 | 8.0 | 40.3 |
| 3641 | Electric lamps | 19.6 | 8.6 | 127.9 |
| 3643 | Current-carrying wiring devices | 181.6 | 96.0 | 89.1 |
| 3644 | Non-current carrying wiring devices | 79.1 | 51.5 | 53.6 |
| 3645 | Residential lighting fixtures | 49.0 | 33.9 | 44.5 |
| 3647 | Vehicular lighting equipment | 10.9 | 6.4 | 70.7 |
| 3652 | Phonograph records, video appartus | 82.2 | 63.0 | 30.5 |
| 3661 | Telephone and telegraph apparatus | 161.2 | 150.8 | 6.9 |
| 3662 | Radio and TV communication equipment | 821.4 | 449.5 | 82.7 |
| 3674 | Semiconductors and related devices | 334.0 | 215.1 | 55.3 |
| 3678 | Electronic connectors | 10.7 | 1.5 | 593.8 |
| 3679 | Electronic components, n.e.c. | 198.1 | 100.2 | 97.6 |
| 3692 | Primary batteries, dry and wet | 14.0 | 5.5 | 153.2 |
| 3693 | X-ray apparatus and electromedical equipment | 26.6 | 11.3 | 135.6 |
| 3713 | Truck and bus bodies | 10.5 | 7.9 | 33.2 |
| 3715 | Truck trailers | 6.5 | 3.4 | 87.8 |
| 3721 | Aircraft | 601.0 | 440.9 | 36.3 |
| 3764 | Space propulsion units and parts | 40.9 | 38.0 | 7.7 |
| 3769 | Space vehicle equipment, n.e.c | 1.7 | 2.5 | -35.1 |

PAYROLL OF HIGH TECHNOLOGY INDUSTRIES
NEW YORK STATE, 1980 AND 1975—Continued

| SIC code | Industry | Payroll | | Percent change |
|---|---|---|---|---|
| | | 1980 | 1975 | |
| 3811 | Engineering and scientific instruments | $261.8 | $164.8 | 58.8 |
| 3822 | Environmental controls | 15.1 | 8.0 | 87.8 |
| 3823 | Process control instruments | 68.8 | 37.7 | 82.6 |
| 3824 | Fluid meters and counting devices | 3.8 | 1.0 | 269.1 |
| 3825 | Instruments to measure electricity | 61.4 | 40.2 | 52.6 |
| 3829 | Measuring and controlling devices, n.e.c. | 46.4 | 22.9 | 102.4 |
| 3832 | Optical instruments and lenses | 45.1 | 29.7 | 52.1 |
| 3841 | Surgical and medical instruments | 82.9 | 45.7 | 81.3 |
| 3842 | Surgical appliances and supplies | 74.7 | 43.4 | 72.2 |
| 3843 | Dental equipment and supplies | 33.1 | 32.5 | 1.9 |
| 3861 | Photographic equipment and supplies | 2,016.9 | 1,250.5 | 61.3 |
| 7372 | Computer programming and software | 92.6 | 22.9 | 305.2 |
| | Total 52 high technology industries | 9,102.2 | 5,578.6 | 63.2 |
| | All private sector industries | 92,131.3 | 60,502.4 | 52.3 |

## Appendix D

### EMPLOYMENT FOR SIX LARGEST HIGH-TECHNOLOGY INDUSTRIES NEW YORK STATE, 1964-1976 AND 1980

(In thousands)

| Year | SIC code [1] | | | | | |
|---|---|---|---|---|---|---|
| | 3861 | 3573 | 3662 | 2721 | 2752 | 3721 |
| 1964 | 48.4 | n.a. | 39.2 | 24.6 | 16.5 | 31.3 |
| 1965 | 52.4 | n.a. | 38.7 | 24.7 | 17.8 | 31.0 |
| 1966 | 59.9 | n.a. | 42.1 | 25.3 | 19.2 | 35.1 |
| 1967 | 65.0 | n.a. | 44.4 | 26.1 | 20.2 | 36.0 |
| 1968 | 66.5 | 44.8 | 45.9 | 26.6 | 20.5 | 37.3 |
| 1969 | 68.3 | 48.5 | 45.5 | 26.3 | 20.8 | 35.1 |
| 1970 | 69.9 | 47.5 | 40.0 | 26.0 | 21.1 | 29.8 |
| 1971 | 69.3 | 43.5 | 32.9 | 24.7 | 21.1 | 24.6 |
| 1972 | 71.4 | 40.8 | 32.7 | 24.1 | 20.7 | 22.9 |
| 1973 | 74.8 | 39.0 | 31.7 | 23.8 | 20.5 | 23.1 |
| 1974 | 77.9 | 42.2 | 30.5 | 24.0 | 20.3 | 25.0 |
| 1975 | 73.9 | 39.5 | 32.0 | 24.1 | 21.8 | 25.5 |
| 1976 | 75.9 | 38.0 | 31.6 | 24.0 | 21.3 | 24.0 |
| 1980 | 78.1 | 47.2 | 40.5 | 26.8 | 25.5 | 22.7 |

[1] *SIC code and industry*

| | |
|---|---|
| 3861 | Photographic equipment and supplies |
| 3573 | Electronic computing equipment |
| 3662 | Radio and TV communication equipment |
| 2721 | Periodicals |
| 2752 | Commercial lithographic printing |
| 3721 | Aircraft |

n.a. Not available.

### PREPARED STATEMENT OF JAMES P. MITCHELL, PASADENA, MD.

In any review of the status of apprenticeship in this country there are two important preliminary considerations:

1. While the two are not inimical, there is a distinction, often ignored, between the administration of public policy in apprenticeship and the administration of an apprenticeship program. Except for those instances where it is the employer and sponsor, governments neither Federal nor State do not "run" apprenticeship. The Federal Bureau of Apprenticeship and Training (BAT) does not conduct training for any apprentice. It, like its counterpart agencies at the State level, is responsible for implementing public policies in apprenticeship. With the exception noted, the conduct of programs of apprenticeship is by private sector employers or employers and unions jointly. Conformity to policies of government apprenticeship agencies by program sponsors is on-the-whole, voluntary.

2. References in this statement to the national apprenticeship system means those programs and their enrolled apprentices collectively that are "registered" or otherwise credentialed by the Federal bureau or appropriate State apprenticeship authority. It is for these programs and apprentices that some information, however limited, is available. Most guesses are that registered apprentices account for about two-thirds of the nation's total although the last comprehensive look at formal training in American industry by the Department of Labor is some 25 years old. Data for registered apprenticeship will likewise soon become out-of-date with the last official data for end of calendar year 1979 collected through the State-National Apprenticeship Program Statistics (SNAPS) system.

A brief description and more important characteristics of the national apprenticeship system is next presented in this statement followed by a discussion of the more important issues in public policy impacting upon the vitality of the system and options for addressing those issues.

## THE NATIONAL APPRENTICESHIP SYSTEM

Apprenticeship, by its generally accepted definition in this country, is a system of structured training given on the job supplemented of by off-job study or instruction in subjects related to the trade being pursued. It is distinguished from other on-the-job training by its objective of a worker fully accomplished in a broad range of skills and family of tasks customarily making up an apprenticeable occupation and by the fact that the conditions of employment and training are known and stated in advance.

The basic fundamentals of sound training and labor standards for apprenticeship that must be met for a program to be registered by the federal agency (BAT) are enumerated in Title 29 CFR Part 29. These same standards have been adopted in principle by all of the existing state apprenticeship agenices who, in doing so, may function in behalf of the Secretary of Labor as the program and apprentice registration authority for federal purposes in their respective states.

The national system is characterized by a large number (above 80% of the the 40 to 50,000 registered programs) of small employers with one or two apprentices and without a bargaining agent. The minority number of registered programs are sponsored by larger industrial establishments jointly with union and by groups of employers banding together as in an association, to sponsor a program most often jointly with a union. These will account for about three-fourths of the apprentices. Moreover, well over one-half of all registered apprentices are concentrated in a dozen occupations with the majority being those of the construction industry.

Most programs of apprenticeship are local, i.e., a single employer with one facility or a group of employers within the same industry banding together to operate a program in that community. Other programs may be state-wide, multi-state or national in scope including the typical multiple plant corporation programs. Finally military sponsored programs for uniformed personnel are world wide.

The federal BAT serves as the direct registration authority in 22 States, for U.S. government sponsored programs, and for certain others that are national in scope. In the remaining States, the District of Columbia, Puerto Rico and the Virgin Islands, the State functions is the approval and registration authority. About one-half of these States and territories (generally referred to as State Apprenticeship Council or SAC states) are without an operating staff.

## ISSUES IN APPRENTICESHIP

### *Adequacy of program level for today and future needs*

The civilian registered apprenticeship level today stands at about 260,000—down more than 50,000 in three years. The historic inverse correlation between new entrants into the program and unemployment rates no longer appears operative. The recovery and recent decline in unemployment rates has not been matched by an upswing in new apprentice registrations and such is unlikely with a continuation of this Administration policies. The decline may to some extent be related to shifts in labor demand profile, but the major cause is the deliberate and continued reduction in the number of people, both Federal and State, engaged in the promotion of new apprenticeship opportunities and programs. The direct correlation between density of apprenticeship staff and density of apprenticeships in a given area on the same population base can be well established. The Administrations reductions and those planned in the employment level for the Bureau of Apprenticeship and Training to about one-half the position level authorized by the Congress three years ago together with retrenchment experienced by many of the State apprenticeship agencies offers no promise the downward trend will be reversed.

The product of apprenticeship is a qualified craft worker. In reasonably stable years of the mid to late 1970's, the annual output of new craft workers had gradually risen to nearly 50,000. The Labor Department's Bureau of Labor Statistics had been estimating the ten year growth needs for skilled workers at some four million or 400,000 annually at an average rate. While those estimates may have overstated the needs it is quite obvious the apprenticeship system will not meet the requirements unless greatly expanded. Shortages of fully qualified skilled workers invariably results in higher product costs, poorer quality, delivery delays, wage pressures, and loss of any real surge capability in our defense industry base.

Compared to other industrial nations of the free world, the United States ranks far behind in apprentices as a percent of total civilian employment (.34, 1980), less than one-half the rate in France (.73) and Canada (.76), less than one-fifth the rate in Great Britain (1.87), less than a tenth that of Italy (3.60) or one-fifteenth of West Germany (5.18) the nation most often cited for the excellence of its apprenticeship system and national commitment to worker training.

*Expanding the program level*

Over-simplified there are three basic ways to expand the appernticeship program. One is to move toward mandatory requirements for establishment of programs and employment of apprentices. It is not universal then through regulatory requirements such as in appropriate government procurement contracts. A second general method is to use financial inducements; in effect to purchase programs and new hires. Obviously there is a point when the inducement is great enough, a decision of not to train can be reversed. A third basic method is that envisaged by Congress in its enactment of the National Apprenticeship Act of 1937 to advance the program by promotion, persuasion and assistance. It is the method this Administration and to a lesser extent the previous Administration expects to be used unsupported by the most modest non-labor and personnel resources. An effective promotional effort cannot be launched at no cost; prospective sponsors cannot be reached on the parsimonious travel dollars allotted for this purpose.

To reverse the downward trend in the program level and build the system to meet the nation's skilled worker requirements for defense and for competition in world markets, a determined commitment must be made. A professional staff of training experts, trained and fully supported, deployed in every major industrial center must be provided for. Staff levels should be increased as rapidly as their absorption and efficient use permits to double and redouble personnel over the next two to three years. Coupled with personnel expansion must be provision for training and retraining of both Federal and State staff, for research in apprenticeship, and for reestablishment of a compehensive national statistical system.

*"New Federalism" and Federal-State roles in apprenticeship*

Apprenticeship does not fit well the mold of "new federalism" as a program to be operated almost wholly within a State for the benefit of the citizenry of that particular State as for example, the employment service. Nor is it a program fundamentally federal or national in character, as for example the public postal service. Certainly the highly skilled worker produced by bona fide apprenticeship is important to the economy of the State in which he or she resides; equally important to the nation's well being is the population of such workers. Moreover, while training takes place at a specific geographic location and many apprenticeships are served entirely with one employer, in one plant, or in one community in one State, others are not. Indeed in the case of apprenticeships for uniformed military personnel, the training may take place outside the United States. Thus it is evident that programs of apprenticeship may be local, multi-state or national and that "the program of apprenticeship" is of both national and State concern. With respect to "new federalism" the issue is whether the administration of public policy is apprenticeship is best performed by federal or State government. The answer is that neither should be exclusively vested and arrangements pursued that would provide a mutliplication, not duplication, of effort. National needs must be served in any event.

The extent of cooperation between the Bureau of Apprenticeship and Training and State Apprenticeship Councils is far more notable than isolated instances of friction. Present formal and informal working agreements have generally served well. Clearly there is a federal role in the collection and analysis of national data, in forecasting, in establishing national priorities, in research, in introducing new techniques, in assisting industry with model, innovative or experimental programs, in serving multi-state sponsors, in assuring standards are met for credentialling, and others including the full range of promotional and technical assistance to industry functions as it does now in SAC States not having an operating capability.

*Administrative procedural barriers to expansion*

The hearings in April, 1937 by the House Subcommittee on Labor identified or anticipated one of the issues that remains today—namely the absence of reasonable uniformity in the requirements for registration among the various State Apprenticeship Councils. Mr. Oscar Rosenthal who at that time represented the National Association of Building Trades Employers testified before the Subcommittee on the necessity of uniformity among the States that ". . . Each State should accept the training of apprentices from all other accredited States . . .". Other witnesses spoke in the same vein on the ". . . necessity for uniformity of training standards between States". The Department of Labor sought to remedy this diversity by publication in 1977 of Title 29 CFR 29, Labor Standards for Registration of Apprenticeship Programs. This regulation to which each SAC subsequently subscribed set forth the basic standards for all to use. It has failed to achieve that objective and sponsors who operate programs in more that one state continue to be confronted with diverse requirements.

Multi-employer unilateral programs sponsored by non-union employers in the construction industry are relatively new on the apprenticeship scene dating from the early 1970's. Up to that period, the Bureau of Apprenticeship and Training's own policies had discouraged such sponsorship. These artificial prohibitions were revoked and in those States where it was the direct registration agency, the Bureau began to register unilateral programs that otherwise met all requirements. Prospective sponsors of this type of program continue to meet resistance or refusal in a number of the SAC states. The regulation, 29 CFR 29, has not proven an effective instrument to remedy this problem.

A third illustration of administrative barriers to program expansion is in the procedure for determining the apprenticeability of occupations. Apprenticeability criteria are published in 29 CFR 29. Of the four criteria only one is specific. The Bureau of Apprenticeship and Training sought (and eventually did so) to establish for its own purposes, specific and objective criteria for determining apprenticeability of occupations within the definition given in the regulation. This was a deliberate effort to remove to the extent possible pressure group influence on such decisions. The Bureau has not succeeded in achieving adoption of these or substitute objective criteria by the State Apprenticeship Councils. Thus a program sponsor might conceivably have registered apprentices in an occupation in one State but find that classification unacceptable when transferring to another State.

*A legislative option*

Forty-six years ago Congress enacted the National Apprenticeship Act in a time of relatively stable labor market conditions and simple industrial environment. The Acts language is general, essentially hortative in character, and its authors anticipated use and growth of the apprenticeship system without the need for more explicit or directive public policy.

Over the same period of time the nation's industrial technology has become increasingly complex as has the economic-social milieu of work and family life. Few indeed are the workers, employers, and jobs unaffected by the stream of governmental employment and training policies and programs of the last few decades. In that same 46 years, government policies for apprenticeship have been administratively generated by both Federal and State to interpret, to adjust, to patch, fix and add-on as circumstances required. The national thrust for a unified program has weakened and diffused among more than 30 differing political jurisdiction approaches. Vitality is rapidly draining from the program from neglect.

The original Act should be amended to review the national thrust for a unified, better coordinated program with a new sense of direction to address specific needs. An amended Act can give legislative standing to certain administrative policies while retaining the proven concepts of the original Act. In addition to dealing with the issues outlined above, and amended Act could:

Cause to be identified occupations in short labor supply and those critical to the nation's defense posture;

Require that employers having substantial contracts with the federal government do their fair share of skill training to reduce competitive bidding for highly skilled workers, improve productivity and quality, and reduce costs;

Give substance to the original Act's hope that the States would take action with respect to their skilled worker resources by providing a mechanism for financial aid to the States when needed;

Insure that the federal government itself as a major employer will be a leader in the development of competent, highly skilled craft workers;

Give meaning to the Congressional intent of the earlier Act for a truly national uniform system of apprenticeship and more carefully delineate Federal and State roles.

A well conceived approach to the legislative objectives was provided in H.R. 4884 offered in the first session of the 97th Congress by Mr. William Clay and Mr. Carl Perkins.

*Conclusion*

The Subcommittee review of the apprenticeship system, a system widely recognized as the most effective means for producing the highly skilled workers essential to the nation's economic well being and defense posture, is indeed timely. Clearly a watershed point has been reached in apprenticeship. Either the system and public policies to undergird that system be vigorously prusued or the governments role in development and maintenance of our skilled resources be abandoned and the public interest ignored.

Apparently the latter course is preferred by the current Administration. The language of the 1980 Republican party platform, "we also support expansion of proven skill training practices such as apprenticeship . . ." is empty of substance. The Administration has chosen to reduce the number of persons engaged in the promotion and provision of technical assistance to the employers for establishment of programs and to camouflage and minimize the effects of the reduction of resources requested for the programs. The employment level of the federal apprenticeship agency is expected to be down by close of this fiscal year to one-half the level of positions Congress had authorized when this Administration took office. In all probability, another 30-35 federal apprenticeship field offices will be closed. No expansion by the States can be anticipated nor could the States be expected to perform the national role as outlined in this statement.

The hearing by this Subcommittee can and should become a turning point in a positive direction for the apprenticeship system.

# OVERSIGHT HEARING ON THE NATIONAL APPRENTICESHIP TRAINING ACT

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THURSDAY, NOVEMBER 17, 1983

House of Representatives,
Subcommittee on Employment Opportunities,
Committee on Education and Labor,
*Washington, D.C.*

The subcommittee met, pursuant to call, at 9:37 a.m., in room 2261, Rayburn House Office Building, Hon. Augustus F. Hawkins (chairman of the subcommittee) presiding.

Members present: Representatives Hawkins, Hayes, Jeffords, Erlenborn, Petri, and Bartlett.

Staff present: Susan Grayson McGuire, staff director; Brad Jefferies, legislative assistant; Terri Schroeder, administrative assistant; Tom Royals, minority labor liaison; and Beth Buehlmann, minority senior legislative associate.

Mr. **Hawkins**. The Subcommittee on Employment Opportunities is called to order. This is a continuation of the hearing on the National Apprenticeship Act. The Chair has no statement. Mr. Erlenborn, do you have a statement.

Mr. **Erlenborn**. No; I have no statement.

Mr. **Hawkins**. Thank you. We will then proceed with the list of witnesses.

The first witnesses are Mr. William M. Ross of William M. Ross and Associates, Inc., Ms. Diann Rust-Tierney of the National Women's Law Center, and Mr. Fred Herzog of the Outreach program.

Would those witnesses whose names were called kindly be seated at the witness table? It is a panel and we will consider the witnesses together.

You are Mr. Herzog?

Mr. **Herzog**. Yes, sir.

Mr. **Hawkins**. Is Ms. Rust-Tierney in the audience?

Ms. **Rust-Tierney**. Yes.

Mr. **Hawkins**. I understand that Mr. Ross will be slightly late. His plane has not yet arrived so we will simply call on him at some subsequent time.

Mr. Herzog, we welcome you and you may proceed. May the Chair indicate that all of the statements will be entered in the record in their entirety, and to the extent possible, we hope that the witnesses will summarize from their statements so as to leave room for questions. We do have a rather lengthy list of witnesses, but everybody will be reached and we will try to give adequate time to each one of them.

Mr. Herzog, we welcome you as the first witness and you may proceed.

[The prepared statement of Frederick Herzog follows:]

### PREPARED STATEMENT OF FREDERICK HERZOG, FORT WASHINGTON, MD.

Good Morning Mr. Chairman and members of the subcommittee. My name is Frederick Herzog, I am a member of the International Association of Bridge, Structural and Ornamental Iron Workers, I am also a past staff member of the National Iron Workers and Employers Training Program, a national training program that through outreach, recruited minorities, females, veterans, displaced workers and other economically disadvantaged persons for training and employment as iron workers. In the year of 1968 I organized and supervised the first journeyman outreach and training program for minorities under federal contract, for all trades associated with the Buffalo Building and Construction Trades Council, I have been associated with apprenticeship since 1952, a total of 30 years. In addition, I was employed as an assistant professor by Erie County Technical Institute and also was appointed apprentice coordinator for the basic trades by the Construction Industry Employers Association of Buffalo, New York.

Permit me, first of all to congratulate this subcommittee for conducting this oversight hearing. This lends an academic atmosphere to the problems under discussion today. The problems of outreach and apprenticeship that this subcommittee is looking at are by no means academic in nature—they are real, in fact frighteningly real.

Why are we talking about outreach here today? Principally because it is badly needed, often overlooked and widely misunderstood, this subcommittee, concerned as it is with unemployment of minorities, displaced persons, females and other economically disadvantaged, should be fully aware of this important system and its possibilities.

First, it is not a system of skill identification promoted by minority groups and construction unions. Many industries are proponents of the system.

Second, it is not just a fancy word that can be applied to any recruitment effort to make the effort more attractive.

Third, outreach is not a simple, single solution of skill identification and job placement.

What then is the role of outreach? First and foremost, it is a system where transferable skills of the unemployed can be identified and with the establishment of requisite skills they can become employable in another industry or trade.

Quality in outreach is an impotant concern of American industry because of the credible role it plays in recruitment and establishment of requisite skills and because of its concern for the general well-being of the unemployed, displaced persons, minorities and females.

Finally, access to employment opportunities have long been a social goal in this nation. The U.S. Department of Labor should remain active in promoting efforts to attain this goal, instead of turning the responsibilities over to other entities.

Mr. Chairman, many serendipitous discoveries are the results of outreach. I would like to break the "outreach" down to its simplest elements because it identifies the reasons why individuals have dead-ended, suffered career arrest, or are otherwise stymied. Outreach is in certain respects typical of a wide variety of educational organizations that are also involved in apprenticeship, based on their participation in related instruction. Of course not all individuals who are school dropouts or persons displaced from career progress can be reactivated or salvaged. However, outreach gives each individual the chance he deserves to protect the investment he has already made.

A significant consideration in assessing the quality of an apprentice program might be the degree to which it is linked to outreach. The absence of such linkage may be the cause of the training sponsor inability to orchestrate passage of the eligible enrollee through a sequence of available services starting from the apprentices initial need and completing, with having attained employability and a job. Instead of watering down standards, outreach reinforces them by matching the individuals' skills to the job instead of trying to match the job to the individual.

A sharp differentiation must be made between outreach services and apprentice training components. The first places the emphasis, with potential, for placement in long-term employment. The attributes of employability can be developed through outreach as well as by training. Good quality training does not guarantee good results in terms of employment and income improvement for its recipients. The status of labor market demand, the access of the recipients to the demand institutions, the consistency between the demand and training, and the learning ability of the training participants are additional variables that are element of outreach.

A notable development, as a result of outreach, has been the expansion of non-occupational training—remedial basic education, English as a second language, job search training, prevocational and preapprenticeship exploration and the like. No overall data is available separating gains from these components from those of other type services, yet the results of many demonstration projects indicate a substantial payoff from at least the first three categories.

Since outreach encompasses opportunities for minorities, females, displaced persons and other economically disadvantaged individuals in jobs placement, training, transfer of skill, individual qualifications and various types of personnel policies it can be a major player in placing into long-term employment many persons who have become unemployable because of plant closings and skill obsolescence.

Outreach is of sufficiently universal value that it should be available to all. It includes understanding of labor market structures and dynamics on a very practical level, criteria for choice among industries, occupations, and employers depending on the job seekers objectives as well as the techniques of job search. Outreach is many things to many people. It can bring about benefits to those of any age, race or any other characteristic of the economically disadvantaged or displaced persons.

Decisions regarding the employment of people are especially hazardous because of the difficulty of knowing all the factors influencing those decisions. Accuracy and reliability in identifying the qualifications of the potential employee is the key to making the right decision. If facts are inaccurate, obsolete, inadequate or distorted, they result in bad decisions. In order to meet the challenge of obtaining facts, faster access to accurate and completed information is available through a good outreach system.

Though improvement is to be expected in the employment picture, there is less reason to be sanguine about the labor market problems of the economically disadvantaged, minorities, displaced persons and females. In the background of the present recession there has been the problem of unemployment because of plant closings creating skill obsolescence and ambitions for economic development and adaptation to technological change. If American industry is to produce and deliver the best product and service continually, it must search for the skills to accomplish this task. Thus, the performance and survival of American industry may depend on profitable utilization of outreach.

No system is ever good enough and no group of human beings ever make a perfect adjustment. The promising factor for the years directly ahead is that what was done largely for compassion may now be more readily accepted as an element of American industry. We have behind us 20 years of productive experience and an outreach system in place which works moderately well. We are not faced with a de novo challenge of invention—which is the present belief of the United States Department of Labor, an empirical error—but with a process of improvement and adaptation. Even in times of public frugality, it is well to keep in mind that the task of outreach will not become cheaper in the years ahead, but funds expended for this activity will be an investment in human resource development for American industry. Significant cost savings and productivity improvements are strong arguments for investing in apprenticeship and outreach.

## STATEMENT OF FREDERICK HERZOG, MEMBER OF THE INTERNATIONAL ASSOCIATION OF BRIDGE, STRUCTURAL & ORNAMENTAL IRON WORKERS, FORMER STAFF MEMBER OF THE NATIONAL IRON WORKERS AND EMPLOYERS TRAINING PROGRAM, REPRESENTING THE OUTREACH PROGRAM

Mr. HERZOG. Good morning, Mr. Chairman and members of the subcommittee, I am Frederick Herzog, past staff member of the national ironworkers and employers training program, a program that through Outreach, recruited minorities, females, veterans, displaced workers, and other economically disadvantaged persons.

In the year of 1968 I organized and supervised the first journeyman Outreach training program for minorities for all crafts associated with the Buffalo Building & Construction Trades Council.

Permit me, first of all to congratulate this subcommittee for conducting this oversight hearing. This lends an academic atmosphere to the problems under discussion. The problems of Outreach and apprenticeship that this subcommittee is looking at are by no means academic in nature—they are real, in fact, frighteningly real.

Why are we talking about Outreach here today? Principally, because it is badly needed, often overlooked, and widely misunderstood.

This subcommittee, concerned as it is with unemployment of minorities, displaced persons, females, and other economically disadvantaged, needs to be fully aware of this important system and its possibilities.

First, it is not a system of skill identification promoted by minority groups in construction unions. Many industries are proponents of the system.

Second, it is not just a fancy word that can be applied to any recruitment effort to make the effort more attractive.

Third, Outreach is not a simple, single solution of skill identification and job placement.

What then is the role of Outreach? First and foremost it is a system where transferable skills of the unemployed can be identified and with the establishment of requisite skills they can become employable in another industry or trade.

Mr. Chairman, many serendipitous discoveries are the results of Outreach. I would like to break the Outreach down to its simplest elements because it identifies the reasons why individuals have dead-ended, suffered career arrest, or are otherwise stymied. Outreach is in certain respects typical of a wide variety of educational organizations that are also involved in apprenticeship, based on their participation in related instruction. Of course, not all individuals who are school dropouts or persons displaced from career progress can be.reactivated or salvaged. However, Outreach gives each individual the chance he deserves to protect the investment he has already made.

A sharp differentiation must be made between Outreach services and apprentice training components. The first places the emphasis with potential, for placement in long-term employment. The attributes of employability can be developed through Outreach as well as by training. Good quality training does not guarantee good results in terms of employment and income improvement for its recipients. A notable development as a result of Outreach has been the expansion of nonoccupational training—remedial basic education, English as a second language, job search training, prevocational and preapprenticeship exploration and the like.

This Outreach encompasses opportunities for minorities, females, displaced persons and other economically disadvantaged individuals in job placement, training, transfer of skill, individual qualifications and various types of personnel policies. It can be a major player in placing into long-term employment many persons who have become unemployable because of plant closings and obsolescence.

Though improvement is to be expected in the employment picture, there is less reason to be sanguine about the labor market problems of the economically disadvantaged, minorities, displaced persons, and females. In the background of the present recession there has been the problems of unemployment because of plant closings creating skill obsolescence and ambitions for economic development and adaptation to technological change. If American industry is to produce and deliver the best product and service continually, it must search for the skills to accomplish this task.

No system is ever good enough and no group of human beings ever make a perfect adjustment. We have behind us 20 years of productive experience and an Outreach system in place which works moderately well. We are not faced with a de novo challenge of invention—which is the present belief of the U.S. Department of Labor, an empirical error—but with a process of improvement and adaptation. Even in times of public frugality, it is well to keep in mind that the task of Outreach will not become cheaper in the years ahead, but funds expended for this activity will be an investment in human resource development for American industry. Significant cost savings and productivity improvements are strong arguments for investing apprenticeship and Outreach.

Thank you, Mr. Chairman.

Mr. HAWKINS. Thank you, Mr. Herzog. We will hear from the other witness and then leave the time open for questions. I understand that Ms. Rust-Tierney has a statement. We will hear from you at this time.

## STATEMENT OF DIANN RUST-TIERNEY, STAFF ATTORNEY, NATIONAL WOMEN'S LAW CENTER

Ms. RUST-TIERNEY. Good morning. Thank you for the opportunity to present testimony today on the status of women in apprenticeship programs.

As you said, my name is Diann Rust-Tierney and I am a staff attorney at the National Women's Law Center. The National Women's Law Center is a Washington based organization which provides legal representation to women's interests. In that capacity we have worked with the problems of sex discrimination in employment, and particular, we have worked on the enforcement of Executive Order 11246 which prohibits employment discrimination by employers receiving Federal contracts.

My testimony will discuss facts which demonstrate that women continue to face barriers to employment in skilled crafts and trades and that programs which have assisted women in removing these barriers are being dismantled.

The first question that should be asked is: Why are organizations like the National Women's Law Center and women interested in getting women into these apprenticeship trades?

The answer to that question is found in the economic status of women. The number of women in the work force has decreased over the past decade dramatically. The increase in the number of women entering the work force coincides with the increased number of women who have substantial financial responsibilities.

Despite the increasing number of women in the work force and the increasing number of women who must support families on their wages and salaries, women remain severely economically disadvantaged. In 1981 the poverty rate for families maintained solely by women was more than three times the poverty rate for families maintained solely by men.

Furthermore, although many are affected by adverse conditions in the economy which cause high unemployment, women experience disproportionately higher rates of unemployment. For example, women in nontraditional construction jobs were more adversely affectly by the recession in the construction industry than their male counterparts.

The unemployment rate among female construction workers was 17 percent as compared to 12 percent for male construction workers. You should remember that in 1979 women only comprised 3 percent of all construction workers.

In 1980 most women earned less than $15,000 annually. The median weekly income for a female-headed family at the end of 1983 was $274 as compared to $426 for a family headed by a man.

Apprenticeships provide women with an opportunity to learn a skilled trade while getting paid wages at much higher rates than many jobs paid to workers with substantial experience in jobs traditionally held by women.

There are basically two ways of entering the trades—the informal nonunion route and the formal union route. Individuals hired through the informal nonunion route are generally hired directly from the community or an established recruitment and training organization.

White males find this informal route a viable means of obtaining a job because informal, old boy networks inform prospective trades workers of openings. Moreover, the presence of the old boy network and familial ties within the trade increases the likelihood that an employer will hire an inexperienced white male on the strength of a recommendation by a friend or a relative.

Women and many minorities, however, rarely enter the trades through familial ties or by applying directly to the contractor for a job. Those networks simply do not exist for women and minorities.

In the heavily unionized areas, the method most often used by women to enter the trades is the union apprenticeship program. As is true of the informal route, the access of women to apprenticeship programs is influenced greatly by cultural stereotypes and discriminatory barriers, which tend to prevent women from becoming apprentices.

Consequently, most women who enter apprenticeships and thus the trades, enter those trades through federally funded Outreach, recruitment and preapprenticeship training programs.

I am going to talk a little bit about the status of women in a number of apprenticeship programs and where women are found. But before I do that I would like to say one thing that I think is very important. When I set out to prepare this testimony, the one thing that I found that was shocking is that there is presently no national information collection system for apprentices and apprenticeship programs in this country. The latest generally available statistics on apprentices was compiled by the Bureau of Apprenticeship and Training in 1979.

Current statistics for apprentices or apprenticeship programs are available only as national totals, that is, the total number of apprentices or apprenticeship programs at the end of a specific period. The problem with too few women in the trades cannot be dealt with effectively unless we have more accurate information about the number of women placed in apprenticeable trades.

Detailed and accurate information about the apprentices themselves is essential to designing apprenticeship programs which address the special needs of women seeking nontraditional jobs.

Women represented 6.6 percent of all apprentices nationwide, although the percentage of registered apprentices who are female has increased steadily from 4 percent in 1979 to 6.6 percent in 1983, the total number of registered women apprentices has actually decreased. The same phenomena is observed for minority apprentices.

The combined statistics for Illinois, Indiana, and Michigan in region 5 indicate that for selected trades a total of 84 percent of women apprentices are either carpenters or electricians. The State apprenticeship council for the State of Virginia reports a total of 6,340 apprentices of which only 755 are women. Fifty percent of those female trades apprentices in the State of Virginia are in the traditionally female trades of cosmetology or cook apprentice.

Although half of all women apprentices were in the construction trades in 1979, as I said earlier, women comprised only 3 percent of all apprentices in that industry.

These statistics indicate that, although the percentage of women has increased, the numbers of women employed as apprentices are still exceedingly small and clustered in a few trades. One question that is always raised about women in apprenticeship programs when we start looking at the small numbers is whether or not there are women available or women who want these jobs.

Mr. HAWKINS. Ms. Rust-Tierney, may the Chair interrupt just for 1 second?

Ms. RUST-TIERNEY. Sure.

Mr. HAWKINS. The Chair is called to the House for a period of about 10 minutes. I say that because I don't want you to think that you have forced me to leave for any reason. [Laughter.]

May I ask Mr. Erlenborn to assume the chairmanship and I shall be back just as quickly as possible.

Thank you very much.

Mr. ERLENBORN. Please proceed.

Ms. RUST-TIERNEY. The question is raised as to whether women want these jobs. The experience of many women's organizations working in this area has been that women do want these jobs. The experience has been that the number of women interested in nontraditional jobs has routinely exceeded the number of positions available. When you go to Outreach centers and ask the people who try and place women that's always the answer.

In San Francisco, for example, an organization funded by Advocates for Women received 1,100 applications from women for 125 positions. The Southeast Women's Employment Coalition advertised for women for heavy road construction and received over 1,600 responses. Again and again, these organizations are finding that women are, when they become aware of these jobs, applying for them.

Even the modest gains made by women are threatened by drastic reductions in funding for Outreach and training programs and lack of civil rights enforcement by the Bureau of Apprenticeship and Training.

As mentioned earlier, the informal networks which have been traditionally used to recruit and hire trade workers tend to exclude women from the skilled trades. Consequently, women are forced to use alternative methods of entering the trades. That alternative has been Government-funded Outreach and training programs.

Outreach and training services are particularly important to the goal of increasing the number of women apprentices because women are more likely to be unfamiliar with career opportunities in the skilled trades than their male counterparts because of sex role stereotyping. Many women, particularly in the age group of women that are now trying to get into these jobs, were not given the opportunity to take vocational education.

Even today, a recent study of vocational education in New York City indicates that vocational education in that State—excuse me, New York State—that vocational education in the State of New York is still sex segregated, and that, furthermore, young women often face hostile attitudes by teachers in classes that have previously only been for young men.

In spite of all of the reasons why Outreach programs are critical to increasing the number of people in apprenticeship programs, there is currently only one federally funded nationwide Outreach program which serves women left in the country. That program is called PREP, Inc., and it is based in Cincinnati and operates in five major cities.

The funds for PREP, Inc., were so drastically reduced in fiscal year 1982 that the program's Long Island site is now operating with a volunteer staff. All other federally funded nationwide, targeted Outreach programs serving women are now closed. Women cannot increase their numbers in apprenticeship programs without these special programs.

The Bureau of Apprenticeship and Training is authorized to conduct compliance reviews and investigate complaints. It may impose sanctions against noncomplying programs. In most areas, sponsors of apprenticeship programs are required to make a good faith effort to meet a 20-percent goal for female apprentices. The Bureau of Apprenticeship and Training has not enforced that 20 percent goal for women. In addition, the Bureau of Apprenticeship and Training rarely, if ever, sanctions programs for violations discovered during compliance reviews.

Another consideration is the maximum age limits for apprenticeship programs. Although the national standards for many apprenticeship programs no longer use maximum age to determine eligibility for admission to apprenticeship programs, these national standards usually do not expressly prohibit local apprenticeship programs from using maximum age ceilings.

These maximum age ceilings limit the pool of women who are otherwise eligible for apprenticeship programs. This has been shown by studies that show that most women who enter apprenticeships do so after they have already had some experience in the work force. Therefore, women seeking apprenticeable trades tend to be in their late twenties and early thirties.

The Department of Labor regulation which provides that sponsors may waive the upper age limits to meet affirmative action goals does not solve the problem entirely because women become discouraged when they learn of maximum age limits or they read of maximum age limits in the eligibility requirements for certain programs. This problem could become increasingly serious when federally funded Outreach programs which had previously recruited older women and informed them of the possibility of waivers, and oftentimes even sought the waivers for these women—as those programs are forced to stop the older women will be again excluded from the pool of eligible applicants for apprenticeships.

Maximum age limits for admission to apprenticeship programs should therefore be prohibited.

Another issue that is important to women in the apprenticeship program is the issue of hazing and harassment. Hazing and sexual harassment by coworkers and supervisors is a major problem for women in nontraditional jobs. At a conference of over 300 tradeswomen from the Midwestern States, hazing and harassment were major topics of discussion and were often cited as the reasons for many women not completing their apprenticeship programs. The ordeal of having to face what at times is a hostile work environment day-in and day-out is often more difficult than mastering the skills of their trade or adjusting to a more vigorous physical routine than they are accustomed to.

In conclusion, although the statistics indicate that women have increased their percentages among apprentices, the number of women employed as apprentices is still far too small. Furthermore, the access of women into the well-paid trades is in grave danger of once again being closed because programs which have been instrumental in increasing the number of women have not been funded.

Congress should reaffirm its national commitment to equal opportunity in apprenticeship trades by providing specific funding for Outreach recruitment and training programs.

More effective enforcement schemes should be developed for the Bureau of Apprenticeship and Training. The present sanctions lack serious consequences for many sponsors and are used by the Bureau too infrequently. The Bureau of Apprenticeship and Training should improve its efforts to conduct compliance reviews and to investigate complaints.

I appreciate the opportunity to discuss the problems facing women in apprenticeship programs. I hope you will consider the issues that have been raised and the recommendations that have been made. I urge you to reaffirm our commitment to equal opportunity in apprenticeship programs.

Mr. ERLENBORN. Thank you very much.

Let me ask first if Mr. Ross happens to have arrived, the third member of the panel?

[No response.]

Mr. ERLENBORN. He has not arrived. I think then we will direct questions briefly to Mr. Herzog and Ms. Rust-Tierney.

Let me begin the questioning by asking you, Ms. Rust-Tierney, can you tell me what the Outreach programs were doing when they were funded on a better basis than they are today? How widespread were they and what was the funding?

Ms. RUST-TIERNEY. As I understand it, the funding was from discretionary moneys within the Department of Labor. This money was not specifically set aside for these programs. What these programs were doing was conducting community awareness programs, going to schools, going to other women's organizations, and, first of all, informing women of the possibility of entering these jobs that they probably had never considered as being a job that a woman could do.

Because of sex role stereotyping and women being told from very young that there are certain things that boys do and certain things that girls do, a number of women are not accustomed to tools. So what these programs would do would be to provide beginning, rudimentary, tool-readiness type of training. This is how this type of tool is used, and just getting women interested and ready to begin an apprenticeship program.

Another service that was provided was counseling. There is some feeling that more of this counseling needed to be done. When women enter nontraditional jobs, because of the harassment that they face they often need the support of other women, of organizations which gives them the strength to go back into work and put up with a lot of the harassment, gives them some idea on how to handle their coworkers. Often times women in nontraditional jobs, as they move into jobs where they are being paid better, there are conflicts in the family because they have to get their husbands accustomed to the possibility that they may be earning more. Women in these situations need the counseling that these services can provide.

Mr. ERLENBORN. Can you tell me, were these Outreach programs specifically designed for women or was this just a component of an overall outreach into the community.

Ms. RUST-TIERNEY. They were a combination of both. There are certain programs such as the program in San Francisco, Women in Apprenticeship Programs, which was a program specifically for women. Other programs were part of programs which had been begun like the recruitment and training program, which was originally started to try and encourage more minority people to enter the trades. Those programs developed components for outreach for women. So we had a combination of both types of programs that were operating.

Mr. ERLENBORN. Who would conduct the Outreach program? Some community organization that would submit a proposal to the Secretary of Labor and then be funded or was it within the Department itself?

Ms. RUST-TIERNEY. It was a community organization, as I understand it.

Mr. ERLENBORN. Mr. Herzog, maybe you can tell us something of the history of Outreach. What level of funding did it have in the past and what is the funding today?

Mr. HERZOG. The best figure that I can state now is the cost of $800 per participant and that would be for approximately a 10-week period. Usually the sponsoring organization got the funding from the U.S. Department of Labor. Now the U.S. Department of Labor has stopped all this.

Mr. **Erlenborn**. There is no funding at all now?

Mr. **Herzog**. Not that I know of. There may be very little. The Job Corps may have some for Outreach, but as far as the really workable programs, they have shut the money off.

Mr. **Erlenborn**. Thank you very much.

Mr. Petri.

Mr. **Petri**. Thank you. I am going to be running off in a minute or two so I will just be very brief.

From my own experience, and that's rather limited, I've found it's hard getting into trades and people often succeed on the basis of family recommendations and this sort of thing; it goes from father to son and so on.

Has there been a change where people who are in trades are beginning to want to get their daughters into the trade. Have you noticed anything of that sort beginning to happen?

Ms. **Rust-Tierney**. I haven't noticed anything of that sort. Getting into the trades through the family is still more of a benefit to males than to women. I think most women entering the trades have done so through the Outreach programs. I don't have any indication that there has been a change in that.

Mr. **Petri**. There are laws in this whole area to try to provide for equal access, but they don't work very well. This is one of the difficult areas where, as you were pointing out, there is still a pattern of intercultural discrimination against women. Maybe, just because of the way it was, it continues to be that way. It's not intended, perhaps, but, nonetheless, it's a problem that we are going to have to address.

Ms. **Rust-Tierney**. Yes, and I think what's happened is that you have the old system of getting into the trades still operating and you have this new Outreach program system which is bringing people in and I don't see either one of those changing the other system very much. I think that they are going to continue to go separately until more women and minority people are in the trades. Perhaps then you will see the need for the other program, the other route.

Mr. **Petri**. I guess the rules or the laws are the stick here, saying that you are supposed to include women and minorities, and imposing penalties for discrimination. Is there some carrot that we can hold out to people to encourage them to reach out to women and minorities? I suppose when jobs are hard to find, people are worried about their family members getting in and it's hard to expand opportunities at that time.

Ms. **Rust-Tierney**. Well, one, I guess, carrot has been the—one reason for programs trying to comply with the national standards for apprenticeship programs has been registered apprenticeship programs get certain benefits. For example, the benefit of the Davis-Bacon Act which allows them to waive some of the minimum standard requirements. That's been the carrot. That's been what has encouraged programs to try and comply with standards.

The problem is that act doesn't apply to all contractors or all sponsors and so, again, if you have small businesses with small contracts that may not be Federal contracts, that carrot doesn't exist for them so there is a need for something more.

Mr. PETRI. Thank you.

Mr. ERLENBORN. Mr. Hayes.

Mr. HAYES. Well, the young lady certainly made a rather comprehensive presentation. You mentioned, in particular, the region which comprises the States of Illinois, Indiana and Michigan. You said 84 percent of the people there wind up as carpenters or electricians. Is there any particular reason they don't enter to the other trades?

Ms. RUST-TIERNEY. I think one of the reasons is that women aren't familiar with the whole range of opportunities in the skilled trades and so women will tend to, when they begin thinking of the nontraditional jobs, think of the more familiar-type jobs like carpenters and electricians. I think that's probably one reason.

Another reason is there has been in these programs an emphasis on getting women into construction jobs, because of the enforcement under Executive Order 11246, which would seem to be very good [illegible] the fact that there were goals under that order originally. So we found placement offices pushing women into those types of jobs. Those may be two reasons.

But, again, one of the things that I have tried to bring out in my testimony is the need for further research as to why women are concentrating—I have given two reasons, but there may be others. There may be other barriers that we are not aware of in the other trades.

Mr. HAYES. To satisfy my curiosity. You mentioned sex discrimination and the lack of employment of women at certain levels of the apprenticeship programs. You didn't break it down according to race. You know, there is two-tier discrimination, as I see it.

Ms. RUST-TIERNEY. Right. It's true. Minority women suffer the problem of double discrimination and so the numbers of minority women among women in each of the trades are even smaller. That's right.

Mr. ERLENBORN. The committee will recess. There is a vote on the floor and we will recess for approximately 15 minutes.

[Brief recess.]

Mr. ERLENBORN. The committee will reconvene.

Some of our members found when they went over to the floor that the schedule had been changed and bills that they were managing may be coming up so we have lost a few.

I would like to ask one or two more questions of this panel and then we will call on the succeeding panel.

Can either of you tell me how many people in absolute numbers have gone through the Outreach program?

Mr. HERZOG. No.

Mr. ERLENBORN. Or would you have a source where you could find that out or I might even ask my staff to do that.

Mr. HERZOG. I doubt it very much, sir. Thousands, I am sure, but I don't believe any record was ever kept. There was the joint apprenticeship training program, the Urban League, OIC. They went through thousands of people. I imagine it would just be impossible to compile these statistics.

Mr. ERLENBORN. When did the Outreach program begin?

Mr. **Herzog**. Outreach really caught on in 1964 with the passage of the Civil Rights Act. We had to go out and find the people that had transferrable skills, that had aptitude for the crafts they wanted to come into or the industries they wanted to enter. We found that many didn't have the aptitude, we found many that didn't have the transferrable skills. Those that we took an individual look at and identified their transferrable skills, what they would need to compete for a job in the industry they desired. We set them on the track for that.

Mr. **Erlenborn**. I am going to ask our staff to see if they can get for the record from the Labor Department the numbers of those who have gone through Outreach and of those numbers, how many have actually entered the trades, and I think most importantly, how many minorities and women have actually been recruited for the trades through the Outreach program. I think those figures would be important for the record.

[The information follows:]

**U.S. Department of Labor**

Assistant Secretary for
Employment and Training
Washington, D.C. 20210

MAY 18 1984

Honorable Augustus F. Hawkins
Chairman, Subcommittee on
Employment Opportunities
Committee on Education and Labor
U.S. House of Representatives
Washington, D.C. 20515

RECEIVED
MAY 23 1984
SUBCOMMITTEE ON
EMPLOYMENT OPPORTUNITIES

Dear Mr. Chairman:

This is in further response to your March 28 letter requesting information on Outreach Programs conducted by the Department of Labor. In our April 16 interim response, we indicated that provision of the detailed information you requested was delayed by the need to determine whether data were available with which to respond.

After an extensive search, we have identified data to respond to your questions, however, these data are incomplete and do not allow for response by fiscal year. Further, no specific data on participation in Outreach Programs, or on completion of apprenticeship were reported. Rather, the reports show the results of the program only in terms of successful completions, or placements.

This letter transmits the available information in as full and complete a fashion as possible and responds to each major area of inquiry. The following information on Outreach Programs is provided:

1. Cumulative Placement Information through 1983
2. Placement Information for Discrete Periods from June 1977 through September 1983
3. Outreach Program Funding Levels for FY 1977 through FY 1983
4. Listing of Sites and Cumulative Placements by Site through 1980
5. Cumulative Placements by Occupation through 1983
6. Outreach Programs and Sites Fiscal Year 1982-83

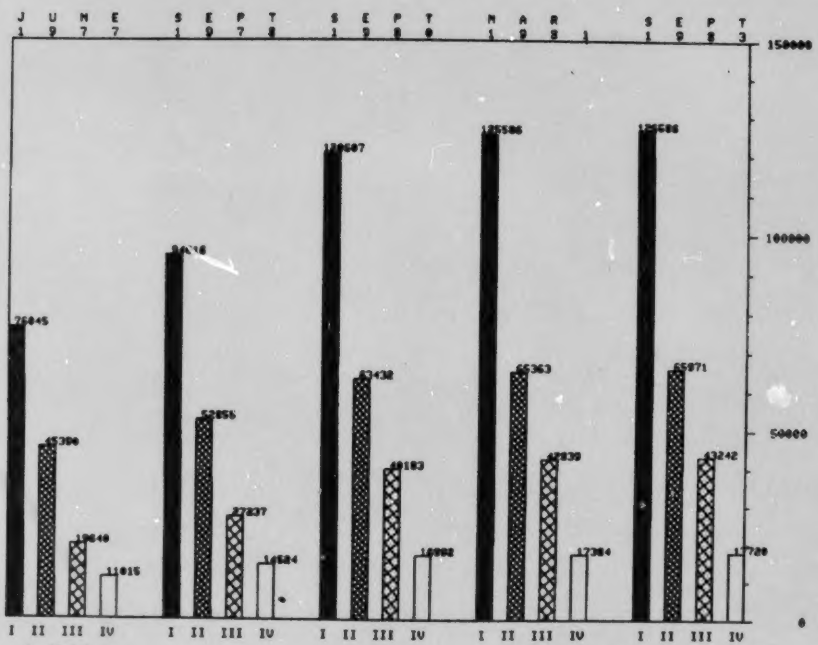
We believe that this information is responsive to your request.

Sincerely,

PATRICK J. O'KEEFE
Deputy Assistant Secretary of Labor

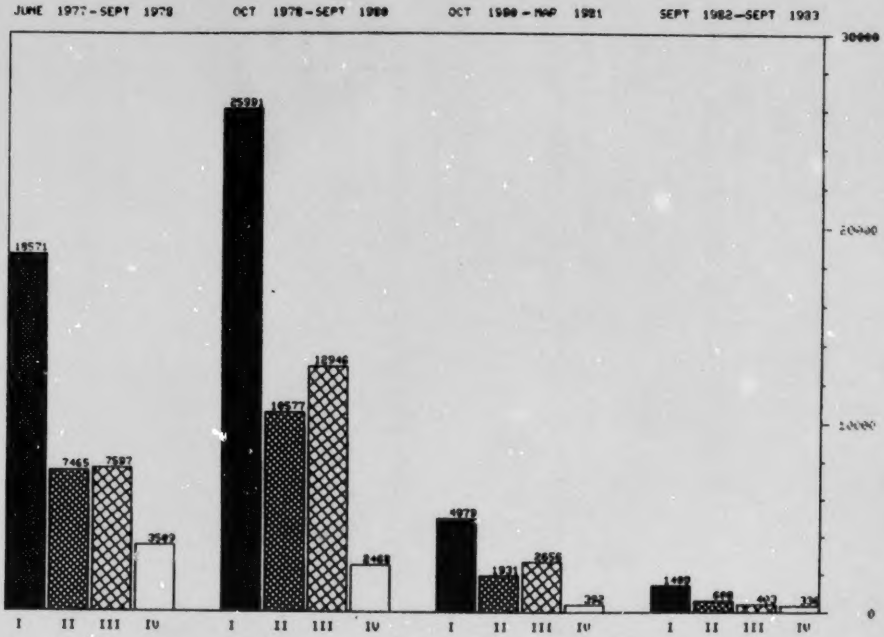
Enclosures

CUMMULATIVE OUTREACH PROGRAM PLACEMENTS
JUNE 1977 - SEPTEMBER 1983



I Total
II Apprentice
III Journeyworker & other skilled
IV Other

OUTREACH PROGRAM PLACEMENTS BY PERIOD
JULY 1977 - SEPTEMBER 1983



I Total
II Apprentice
III Journeyworker & other skilled
IV Other

## TARGETED OUTREACH PROGRAM
## FUNDING FY 1977 - 1983

| Fiscal Year | Funding ($000's) |
|---|---|
| 1977 | $15,800 |
| 1978 | 20,700 |
| 1979 | 19,500 |
| 1980 | 15,200 |
| 1981 | 17,800 |
| 1982/83 | 2,500 |

# Outreach Programs and Sites
# with Numbers of Total Placements
# through 12/31/80

## National Urban League

| Sites | Placements | |
|---|---|---|
| | APP 1/ | J&O 2/ |
| Akron, OH. | 436 | 128 |
| Albany, GA. | 247 | 97 |
| Atlanta, GA. | 1,033 | 412 |
| Baltimore, MD. | 1,110 | 97 |
| Charlotte, NC. | 2 | 24 |
| Chicago, ILL. | 2,943 | 1,383 |
| Colorado | 1,507 | 751 |
| Columbia, SC. | 1,405 | 602 |
| Columbus, OH. | 417 | 169 |
| Dayton, OH. | 415 | 159 |
| Flint, MI. | 892 | 351 |
| Hartford, CT. | 336 | 159 |
| Jackson, MS. | 177 | 221 |
| Jacksonville, FL. | 357 | 134 |
| Kansas City, MO. | 841 | 277 |
| Los Angeles, CA. | 1,067 | 192 |
| Louisville, KY. | 342 | 142 |
| Miami, FL. | 609 | 109 |
| Minneapolis MN. | 780 | 309 |
| Peoria, ILL. | 282 | 180 |
| Phoenix, AZ. | 1,148 | 289 |
| Portland, OR. | 504 | 538 |
| Racine, WI. | 263 | 337 |
| Richmond, VA. | 218 | 238 |
| St. Louis, MO. | 823 | 529 |
| St. Paul, MN. | 906 | 1,106 |
| Springfield, ILL. | 227 | 273 |
| Tacoma, WA. | 492 | 579 |
| Tallahassee, FL. | 117 | 72 |
| Tampa, FL. | 255 | 130 |
| Tucson, AZ. | 137 | 93 |
| Tulsa, OK. | 428 | 99 |

## Recruitment Training Program

| Sites | Placements | |
|---|---|---|
| | APP | J&O |
| Alexandria, LA. | 203 | 91 |
| Anderson, SC. | 15 | 173 |
| Boston, Mass. | 803 | 911 |
| Bridgeport, CT. | 287 | 305 |
| Bronx, NY. | 469 | 478 |
| Brooklyn, NY. | 1,870 | 1,178 |
| Buffalo, NY. | 325 | 322 |
| Charlotte, NC. | 464 | 511 |
| Cleveland, OH. | 1,155 | 250 |
| Orlando, FL. | 314 | 208 |
| E. Chicago, IL. | 247 | 121 |
| El Dorado, AR. | 50 | 220 |
| Evansville, IN. | 235 | 520 |
| Greensboro, | 303 | 264 |
| Harlem, NY. | 1,279 | 789 |
| Huntsville, AL. | 15 | 185 |
| Lexington, KY.. | 183 | 17 |
| Nashville, TN. | 183 | 17 |
| Nassau Co, NY. | 315 | 446 |
| Newark, NJ. | 145 | 47 |
| New Haven, CT. | 318 | 102 |
| Pascagoula, MS. | 679 | 3,808 |
| Pittsburgh, PA. | 125 | 157 |
| Providence, RI. | 293 | 282 |
| Raleigh/Durham, NC. | 331 | 134 |
| Rochester, NY. | 664 | 486 |
| Jamaica, NY. | 153 | 460 |
| Savannah, GA. | 291 | 217 |
| Suffolk Co. NY. | 348 | 403 |
| Tupelo, MS. | 192 | 649 |
| Wilmington, NC. | 473 | 205 |
| Youngstown, OH | 234 | 183 |

## Human Resources Dev. Institute (HRDI)

| Sites | Placements | |
|---|---|---|
| | APP | J&O |
| Albuquerque, NM. | 652 | 533 |
| Birmingham, AL. | 564 | 0 |
| Casper, WY. | 368 | 15 |
| Chattanooga, TN. | 338 | 98 |
| Corpus Christi, TX. | 428 | 0 |
| Dallas, TX. | 820 | 90 |
| Des Moines, IA. | 351 | 158 |
| E. St. Louis IL. | 461 | 163 |
| El Paso, TX. | 564 | 372 |
| Ft. Worth, TX. | 556 | 29 |
| Gary, IN. | 436 | 292 |
| Houston, TX. | 1,239 | 53 |
| Knoxville, TN. | 392 | 65 |
| Memphis, TN. | 539 | 8 |
| Mobile, AL. | 358 | 587 |
| Norfolk, VA. | 250 | 251 |
| Oklahoma, City, OK. | 568 | 11 |
| Rock Island, IL. | 255 | 36 |
| Salt Lake City, UT. | 531 | 66 |
| San Antonio, TX. | 477 | 13 |
| Spokane, WA. | 418 | 14 |
| Topeka, KS. | 299 | 32 |

## Other Contractors

| Sites | Placements | |
|---|---|---|
| | APP | J&O |
| Anchorage, AK. | 42 | 0 |
| Chicago, ILL. | 136 | 775 |
| Cincinnati, OH. | 968 | 741 |
| Denver, CO. | 353 | 490 |
| Detroit, MI. | 1,101 | 64 |
| Los Angeles, CA. | 1,185 | 252 |
| New Jersey, NJ. | 478 | 493 |
| Oakland, CA. | 1,977 | 61 |
| Pasco, WA. | 181 | 160 |
| Philadelphia, Pa. | 924 | 224 |
| Sacramento, CA. | 794 | 103 |
| Santa Ana, CA. | 1,233 | 422 |
| San Francisco, CA. | 1,038 | 170 |
| San Francisco, CA. | 344 | 322 |
| Trenton, NJ. | 243 | 71 |
| Wilmington, DE. | 117 | 179 |
| United Auto Workers | 2,601 | 0 |
| Int'l Assoc. Firefighters | 48 | 2,953 |

1/Apprentice
2/Journeyworker & Other Skilled

## PLACEMENTS IN SKILLED OCCUPATIONS AND TRADES
## FY 1977 - FY 1983 CUMULATIVE

| Placements in Skilled Occupations and Trades | Apprentices | Journeyworkers Other | Trade |
|---|---|---|---|
| Asbestos worker | 841 | 160 | 1,001 |
| Bricklayer | 2,638 | 868 | 3,506 |
| Carpenter | 13,486 | 4,263 | 17,749 |
| Cement masonry | 2,729 | 985 | 3,714 |
| Electrician | 9,340 | 2,582 | 11,922 |
| Elevator Construction | 1,262 | 290 | 1,552 |
| Glazier | 489 | 122 | 611 |
| Ironworker | 3,655 | 1,802 | 5,457 |
| Lather | 566 | 143 | 709 |
| Machinist | 1,229 | 894 | 2,123 |
| Operating Engineer | 4,550 | 2,384 | 6,934 |
| Painter | 4,326 | 2,353 | 6,679 |
| Pipe Trade | 7,267 | 3,525 | 10,792 |
| Plasterer | 753 | 155 | 908 |
| Roofer | 2,556 | 957 | 3,513 |
| Sheetmetal | 3,669 | 749 | 4,418 |
| Tilesetter | 271 | 286 | 557 |
| Other | 6,633 | 20,435 | 27,068 |
| TOTAL | 66,260 | 42,953 | 109,213 |

## OUTREACH PROGRAMS AND SITES
## FISCAL YEAR 1982 - 83

**Recruitment Training Program (RTP)**

- San Francisco
- Pascaguola
- Savannah
- Orlando
- New York City
- Long Island
- Evansville
- Boston

**Preparation Recruitment Employment Program Inc. (PREP)**

- Cininnati
- Kansas City
- San Francisco
- New Orleans
- Long Island

**State of Florida**

- Jacksonville
- Orlando
- Miami

Footnote:
Contractor not required to report information at the site level.

U.S. DEPARTMENT OF LABOR
SECRETARY OF LABOR
WASHINGTON, D.C.

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APR 16 1984
SUBCOMMITTEE ON
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APR 13 1984

Honorable Augustus F. Hawkins
Chairman, Subcommittee on
  Employment Opportunities
Committee on Education and Labor
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

This is in response to your letter of March 21, 1984, regarding the Department's delay in responding to your earlier request for information concerning the apprenticeship system and the Targeted Outreach Program.

I have investigated this matter and have concluded that the delay inadvertently occurred as the response was prepared, reviewed and revised. It was a case of too many people becoming involved in a project that should have been handled more expeditiously than it was. I am advised that the final response was mailed on March 20, 1984. I regret the delay and any inconvenience it may have caused.

Sincerely,

Raymond J. Donovan

Raymond J. Donovan

**U.S. Department of Labor**

Assistant Secretary for
Employment and Training
Washington, D.C. 20210

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APR 24 1984
SUBCOMMITTEE ON
EMPLOYMENT OPPORTUNITIES

APR 16 1984

Honorable Augustus F. Hawkins
Chairman, Subcommittee on
Employment Opportunities
Committee on Education and Labor
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

This is an interim response to your March 28 letter requesting further information on Outreach Programs conducted by the Department and on the status of the Federal Committee on Apprenticeship.

We have enclosed a listing of the members of the Federal Committee on Apprenticeship for which Mr. William F. X. Flynn has been designated as Chairman by the Secretary. The next planned meeting of the Committee will be in mid June of this year. The Department plans to renew the charter of the Committee prior to its September expiration date.

With respect to Outreach Programs, we are currently conducting research to determine whether data are available to respond to your request. We will provide you with a further response at the earliest possible date.

Sincerely,

Patrick J. O'Keefe
Deputy Assistant Secretary of Labor

Enclosure

## FEDERAL COMMITTEE ON APPRENTICESHIP

### LABOR REPRESENTATIVES

#### CURRENT

(85) Mr. John W. Bowden
President
Northeast Florida Building and
Construction Trades Council
3707 Liberty Street
Jacksonville, Florida 32206

(86) Mr. Clarence E. Spoon
Secretary-Treasurer
Chief Executive Officer
Teamsters Union Local No. 36
4626 Mercury Street
San Diego, CA 92111

(86) Mr. Thomas Martinez
National Secretary-Treasurer
National Maritime Union
of America, AFL-CIO
346 West 17th Street
New York, New York 10011

(86) Mr. David A. Leff
Executive Director
Joint Maritime Congress
444 N. Capitol Street
Washington, D.C. 20001

(85) Mr. Stephen P. Yokich
International Vice President
(Director of Skilled Trades Dept.)
International Union, United
Automobile, Aerospace &
Agricultural Implement Workers
of America-UAW
8000 East Jefferson Avenue
Detroit, Michigan 48214

(85) Mr. Reese Hammond
Director of Education and
Training
International Union of
Operating Engineers, AFL-CIO
1125 17th Street, N.W.
Washington, D.C. 21136

(85) Mr. Joseph P. Holleran
Training Coordinator
United Association of Journeymen
and Apprentices of the Plumbing
and Pipe Fitting Industry
412 Reel Avenue
Pittsburgh, PA 15229

### MANAGEMENT REPRESENTATIVES

#### CURRENT

(85) Mr. M. C. Boswell
American General
Investment Corporation
P.O. Box 1375
Houston, Texas 77001

(85) Mr. Fred Del Conte
President & Chief Executive
Officer
Arrowhead Tool Builders, Inc.
428 Chestnut Street
Phoenix, New York 13135

(85) Mr. R. Dale Huber
Manager of Technical Training
R. R. Donnelly & Sons, Inc.
216 Greenfield Road
Lancaster, Pennsylvania 17601

(85) Mr. Eric F. Jensen
Vice President
Government and Labor Relations
ACF Industries, Incorporated
750 Third Avenue
New York, New York 10017

(85) Mr. Ted C. Kennedy
President
BE&K, Inc.
P.O. Box 2332
Birmingham, Alabama 35201

(85) Mr. Carmel R. Morris
Vice President
Allstate Electric
Contractors, Inc.
6905 Bonneval Avenue
Jacksonville, FL 32216

(84) Mr. William Pemberton
J. S. Alberici Construction
Company
2150 Kienlen Avenue
St. Louis, Missouri 63121

(86) Mr. Norman C. Hill
Employee Relations Supervisor
Southeastern Production Division
Exxon Company, U.S.A.
P.O Box 60626
New Orleans, Louisiana 70160

(85) Mr. Edward P. Reavey, Jr.
President
Edward P. Reavey Company
Box 145
Bernardsville, New Jersey 07924

### PUBLIC MEMBERS

#### CURRENT

(85) Mr. William F. X. Flynn
Associate Vice President
for Public Affairs
University of Bridgeport
285 Park Avenue
Bridgeport, CT 06602

(86) Mrs. M. Paula Raposa
Executive Director
Southeastern Massachusetts
SER/Jobs for Progress
322 Washington Street
Fall River, MA 02721

(85) Mr. Louis L. Levine
Vice President for Public Affairs
Blue Cross Blue Shield of
Greater New York
3 Park Avenue
New York, New York 10016

(86) Mr. Fred P. Ramirez
Executive Director
Southern New Employment and
Training Program
601 S. 3rd Street
Suite 503
Las Vegas, NV 89101

NOTE: (85)(86) indicates expiration date of appointment.

BEST COPY

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COMMITTEE ON EDUCATION AND LABOR
U.S. HOUSE OF REPRESENTATIVES
B-346A RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, D.C. 20515

SUBCOMMITTEE ON EMPLOYMENT OPPORTUNITIES

March 21, 1984

Honorable Raymond Donovan
Secretary of Labor
U. S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

Dear Secretary Donovan:

As I am sure you are aware, the Subcommittee on Employment Opportunities, which I chair, conducted oversight hearings on the National Apprenticeship Act on November 15 and 17, 1983. The Subcommittee heard testimony from representatives of the various aspects of the National Apprenticeship System in an effort to evaluate the current status and future direction of the program. The Subcommittee was enlightened by information received at the hearings, and plans to conduct more in the future.

What you may not be aware of is the negligence your Department has displayed in responding to a series of questions that I submitted. During the hearings, several questions arose concerning the Targeted Outreach Program funded by the Department of Labor and the national apprenticeship data collection system. My letter of December 9, 1983 (enclosed) formally requested the information which the Subcommitee desired. I instructed my staff to work with your Department to collect this information.

Mr. Donovan, it has been over four months since that initial request was submitted to your agency. Since that time, my Subcommittee staff has made numerous calls to the office of Acting Assistant Secretary Patrick O'Keefe in pursuit of a response. The repeated frustration that they have met with on this matter is extremely distressing to me. At best, one can interpret this lack of responsiveness as merely a lack of efficiency within your agency. At worst, it can be seen as an affront to the Subcommittee on Employment Opportunities, the U.S. House of Representatives, and an indication of your lack of interest in this time-honored and cost effective program. Presently, I am inclined to believe that this entire matter is a result of the former explanation; however, if my Subcommittee does not receive the requested information by March 22, I can only assume that the latter explanation is correct.

Kindly see to it that the information I requested from your Department is transmitted in time to arrive by that date. If you have any questions or wish additional information on this matter, feel free to contact Bradley Jefferies of my Subcommittee staff at 225-1927.

Sincerely,

Gus Hawkins

Augustus F. Hawkins
Chairman

AFH:bjb

Enclosure

cc: Patrick O'keefe

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U.S. HOUSE OF REPRESENTATIVES
B-346A RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, D.C. 20515

SUBCOMMITTEE ON EMPLOYMENT OPPORTUNITIES

December 9, 1983

Mr. Royal Dellinger
Acting Assistant Secretary for
Employment and Training
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

Dear Mr. Dellinger:

As you are undoubtedly aware, the Subcommittee on Employment Opportunities, which I chair, conducted oversight hearings on the National Apprenticeship Act on November 15 and 17, 1983. The purpose of the hearings was to ascertain the current status of the National Apprenticeship Program, and to identify the future policy direction that the Federal government should pursue. Testimony was received from the labor, industry, and education and training communities, and from representatives of minorities, women, and state governments.

During the course of the hearings, several questions arose concerning the Bureau of Apprenticeship and Training. The Subcommittee would find it extremely helpful if you would promptly respond to these questions, listed below, so that they can be included in the hearing record.

1) Several witnesses alluded to the fact that the State and National Apprenticeship Reporting System (SNAPS) was eliminated in a budget cut in January of 1980.

   - When, if ever, does the BAT plan to reactivate SNAPS?
   - By what mechanism has the BAT collected statistical data on apprenticeship since the SNAPS was eliminated?
   - Please forward to the Subcommittee all available statistical information concerning apprenticeship since January, 1980.

2) Witnesses also spoke of other budget cuts within the BAT during the past three years. The Subcommittee requests a copy of the total budget for the BAT for fiscal years 1977 through 1983. We are particularly interested in the allocation of funds for: promotional activities for apprenticeship; BAT staff positions; and, apprenticeship outreach programs.

3) The hearings also addressed the Apprenticeship Outreach effort of the BAT. The Subcommittee is interested in a complete statistical analysis of the effectiveness of outreach programs funded by the Department of Labor. In particular, the Subcommittee requests information concerning the number of people who began outreach programs each year, the number who successfully completed the programs, the number who entered an apprenticeship program, and the number who successfully completed the apprenticeship program, thus achieving journeymen status in the trade. We are interested in this data for each year that the Department of Labor funded Apprenticeship Outreach programs.

I would appreciate your prompt response to our requests. This information will prove extremely valuable to us in our efforts to evaluate the National Apprenticeship Programs.

With warm regards, I am

Sincerely,

Augustus F. Hawkins
Chairman

AFH:tps

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U.S. HOUSE OF REPRESENTATIVES
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WASHINGTON, D.C. 20515

SUBCOMMITTEE ON EMPLOYMENT OPPORTUNITIES

March 28, 1984

Mr. Patrick O'Keefe
Deputy Assistant Secretary for
Employment and Training
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

Dear Mr. O'Keefe:

On March 21, my Subcommittee staff received the information that I requested from former Assistant Secretary Dellinger in my December 9, 1983 letter. Unfortunately, your replies to some of the questions were less than adequate.

In question number two, you were asked for the budget allocation for the Outreach Programs funded by the DOL for fiscal years 1977 through 1983. This information was not contained in your March 21 reply. The Subcommittee again reiterates its request for this information. Your response to question number three was merely an aggregate figure for the number of individuals who had participated in Outreach Programs since 1968. We specifically asked for a more detailed breakdown. To reiterate our request, the Subcommittee would like a complete statistical analysis of the effectiveness of Outreach Programs funded by the DOL. This analysis should include, but need not be limited to, figures representing:

- the number of people who began Outreach Programs;
- the number of people who successfully completed the program;
- the number of Outreach graduates who entered an apprenticeship program;
- the number of Outreach graduates who successfully completed the apprenticeship program, thus achieving journeyman status in the trade;

for each year that the programs were funded.

At this time, we would like to request some additional information. With respect to question number two, we would like the figures representing the actual outlays for Outreach Programs, as well as the number and location of these programs and the number of participants served in each program for each year during the fiscal years 1977 through 1983.

Regarding question number three, we would like to know the specific trades that are represented in the second, third and fourth of the above categories of Outreach participants.

Finally, we are interested in the current status of the Federal Committee on Apprenticeship. Specifically, we would like to know who the current members of the committee are, who the chairman is, when the next meeting will be held, and whether or not the committee will be recommissioned prior to its September 27, 1984 expiration date.

Because we need this information to complete the official record of the November 1983 hearings on apprenticeship, kindly respond to our requests as soon as you possibly can. If you anticipate any difficulties in meeting these requests, please contact Brad Jefferies of my Subcommittee staff at 225-1927.

Sincerely yours,

Augustus F. Hawkins
Chairman

AFH:bjt

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   - Please forward to the Subcommittee all available statistical information concerning apprenticeship since January, 1980.

2) Witnesses also spoke of other budget cuts within the BAT during the past three years. The Subcommittee requests a copy of the total budget for the BAT for fiscal years 1977 through 1983. We are particularly interested in the allocation of funds for: promotional activities for apprenticeship; BAT staff positions; and, apprenticeship outreach programs.

3) The hearings also addressed the Apprenticeship Outreach effort of the BAT. The Subcommittee is interested in a complete statistical analysis of the effectiveness of outreach programs funded by the Department of Labor. In particular, the Subcommittee requests information concerning the number of people who began outreach programs each year, the number who successfully completed the programs, the number who entered an apprenticeship program, and the number who successfully completed the apprenticeship program, thus achieving journeymen status in the trade. We are interested in this data for each year that the Department of Labor funded Apprenticeship Outreach programs.

I would appreciate your prompt response to our requests. This information will prove extremely valuable to us in our efforts to evaluate the National Apprenticeship Programs.

With warm regards, I am

Sincerely,

Augustus F. Hawkins
Chairman

AFH:tps

Ms. **Rust-Tierney.** I may be able to identify for staff some programs that have placed women that may have kept records that could give you some figures.

Mr. **Erlenborn.** Thank you.

Mr. **Herzog.** Mr. Chairman, I would like to point out one thing about Outreach. I have been following the training and retraining program in California of the auto workers and according to the Washington Post this program was a dismal failure. I often ask myself the question, why was each of these men who have reached out and identified their previous skills like, they went into an electronics class? If they didn't have any background in mathematics, they were almost failures before they started the program, and then again, they may not have the aptitude. This is one of the benefits of the Outreach is to prevent failures of this type, not to encourage. Outreach reinforces the standards set by industries. It doesn't tear them down, if it's handled right.

Mr. **Erlenborn.** Thank you for that comment. I don't recall where I read it, but recently I did read a commentary on that series of articles and the thrust of the commentary was that it was a program designed for failure. They tested so that they could find those without an aptitude and put them in the program and then had all kinds of disincentives built in. So I hope that not too many people were discouraged because of reading that series of articles, but would know to put it in context. Training, retraining and apprenticeship and so forth are valuable tools.

Mr. Hayes, do you have any further questions?

Mr. **Hayes.** No; thank you.

Mr. **Erlenborn.** Mr. Gunderson.

Mr. **Gunderson.** One thing that I would be interested in is the history of the Outreach program, and the success of that. Is there any indication in the followthrough through the apprenticeship that those who are brought in as a result of Outreach are also successful down through the apprenticeship programs? Do we have any kind of history statistics on that?

Mr. **Herzog.** The programs that I was connected with, yes, we did. We kept a running tally, an updated inventory of the whole thing. For instance, in Buffalo, the first program of Outreach training we took in 50 minorities and 48 of them passed. I think that the past program that I was associated with took in probably 3,000 and we probably graduated 2,200 people out of 3,000; they received their journeyman's card, union card.

Ms. **Rust-Tierney.** There was a study conducted in 1970 of several Outreach programs for women and what came out of that study was that the majority of women going through the Outreach programs successfully completed their training to the point of being certified as apprentices. It was the majority of women that went through that program and then compared to, like, 14 percent of the people who went through those Outreach training programs were unable to complete the apprenticeship programs.

Mr. **Gunderson.** Is the basic need for Outreach one of knowledge and awareness to that potential skilled tradesmen or is the problem that if you don't have Outreach you simply have those roadblocks, those fences there, either by the company, by the union, by whoever or a combination? What's the basic need? Which side?

Mr. **Herzog**. There has to be a balance. Industry needs a certain amount of people and you have got to give that industry the people that not only complete apprentice programs, but the success of it is, does he remain in the industry after he completes his training?

Mr. **Gunderson**. Does apprenticeship follow through that long?

Mr. **Herzog**. Pardon?

Mr. **Gunderson**. Excuse me, does the Outreach program follow through that long?

Mr. **Herzog**. Yes, we did.

Ms. **Rust-Tierney**. I think what you're saying—it's a combination of all of those things in the case of women. First of all, you have to make women aware that these nontraditional jobs are really jobs that they can consider and, as I said before, for women, a lot of what has to happen is familiarization with the common tools. Also there are support services that are needed for women because their taking a nontraditional job may cause changes in their family's living situations. They may need services such as child care services or transportation services. So, for all of those reasons Outreach programs are important.

Mr. **Gunderson**. I don't want to take any more time but I do want to ask one final question. That is, let's take women's Outreach programs. What is the major tool of that Outreach program? Do you get to the high school guidance counselors? Do you work in the job service program? Where is it that women's Outreach really makes that contact?

Ms. **Rust-Tierney**. I think that it has to be all of those places. I think that they have to go to the schools and make young women aware of the opportunities. I think that these Outreach programs have served as go-betweens, they have developed relationships with the employer and unions that are sponsoring these programs so that those sponsors are more likely to treat those new women favorably or at least fairly. I think it has to be at each one of those stages.

Mr. **Gunderson**. OK. Thank you, Mr. Chairman.

Mr. **Hawkins**. Mr. Jeffords.

Mr. **Jeffords**. I have no questions of this panel, Mr. Chairman.

Mr. **Hawkins**. May I ask the witnesses, with respect to the dropout rate for minority apprentices, my understanding is that the dropout rate is 1.5 times as great as for those who enter the program as those who actually complete the program. Would either of you care to explain why this very high dropout rate exists?

Mr. **Herzog**. I believe you can trace your dropout rate back to the Outreach functions. I have noticed that you can go into a city and start up an employment training program and you have got everybody standing in line. Many people just filled out papers and they were sent to jobs. If they had been looked at first and coached and put on the right path, I feel that that dropout rate would diminish way down. There were many people put into industries that just didn't have the aptitude to get into it, and after they got into it they couldn't compete with the training.

Mr. **Hawkins**. Are you saying that minority apprentices are not screened as carefully as others?

Mr. **Herzog**. Well, that's all apprentices. I don't think the minority apprentices' dropout rate is any higher than the white rate.

Mr. **Hawkins**. Well, we seem to have——

Mr. **Herzog**. I think it's pretty well balanced out.

Ms. **Rust-Tierney**. I think for women one thing that needs to be looked at more closely—I suggested it in my testimony—is whether or not harassment on the job attributes to women not completing their apprenticeship programs. It is my understanding from talking to women who are going to these programs that more than the difficulty of learning the skills and perhaps even the difficulty of adjusting to the physical requirements of the job plays a big factor in whether they can make it another day—whether they can get up and go to those job sites. So I think that further study about that is necessary.

That would be one suggestion that I would have with regard to women.

Mr. **Hawkins**. Well, the figure that we have is from a GAO report in 1979 that said that the dropout rate of apprentices was extremely high and that it amounts to 1.5 times as often as they complete the programs. In the case of white apprentices, there are two times more completions than dropouts. We are relying on this GAO report from 1979 for this information.

Any further questions?

[No response.]

Mr. **Hawkins**. If not, may we again thank the two witnesses, Ms. Rust-Tierney and Mr. Herzog. You have been extremely helpful.

[The prepared statement of Diann Y. Rust-Tierney follows:]

### PREPARED STATEMENT OF DIANN Y. RUST-TIERNEY, NATIONAL WOMEN'S LAW CENTER, WASHINGTON, D.C.

Thank you for the opportunity to present testimony today on the status of women in apprenticeship programs. My name is Diann Y. Rust-Tierney, I am a staff attorney at the National Women's Law Center.

The National Women's Law Center is a Washington-based organization which provides legal representation for women's interests. In this capacity, we have worked on the problems of sex discrimination in employment. We have worked, in particular, on the enforcement of Executive Order 11246 which prohibits employment discrimination by employers receiving federal contracts.

My testimony will discuss facts which demonstrate that women continue to face barriers to employment in the skilled crafts and trades and that programs which have assisted in removing these barriers are being dismantled.

#### THE ECONOMIC STATUS OF WOMEN

The number of women in the workforce has increased over the past decade from 26 million in 1970, or 35 percent of the civilian labor force, to 43 million or 43 percent of the civilain labor force in 1983.[1] This increase coincides with the increasing number of women who must either work to supplement a family income [2] or work to support a family alone. In 1981, 21 percent of women were married to men who earned $15,000 or less.[3] In 1983 nearly 60 percent of women in the labor force were the sole support for themselves and their families.[4]

Despite the increasing number of women in the workforce and the increasing number of women who must support families on their wages and salaries, women remain severely economically disadvantaged. In 1981, the poverty rate for families maintained solely by women was more than three times the poverty rate for families maintained soley by men.[5] The poverty rate for female-headed families was five times the poverty rate for married-couple families.[6] Although many are affected by adverse changes in the economy which cause high unemployment, women experience disproportionately higher rates of unemployment.[7] Even when the economy is expanding, or recovering, women remain disproportionately unemployed.[8] In 1981, 61 percent of Black women, 51 percent of Hispanic women and 45 percent of white women as compared to 35 percent of white men were either unemployed or underemployed.[9] Women in nontraditional construction jobs were more adversely affected by the recession in the construction industry than their male counterparts. The unemployment rate among female construction workers was 17 percent as compared to 12 percent for male construction workers in 1981.[10]

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[1] Women Employed Institute, "Working Women Challenging the Status Quo," 3 (1983).

[2] U.S. Department of Labor, Bureau of Labor Statistics," 20 Facts on Women Workers," (1982).

[3] Id.

[4] Women Employed Institute, "Working Women Challenging the Status Quo," (1983).

[5] U.S. Commission on Civil Rights, "A Growing Crisis: Disadvantaged Women and their Children," 7 (1983).

When women are employed, they are concentrated in jobs which provide low pay and few opportunities for advancement. In 1983 women were 81 percent of all clerical workers, 45 percent of all retail sales workers, and 62 percent of all service workers, but only 7 percent of all craft workers and 4 percent of all apprentices.[11] In 1980, most women (60 percent) earned less than $15,000 annually as compared to only 28 percent of all men.[12] Forty-seven percent of all men earned over $20,000 annually as compared to ten percent of all women.[13] The weekly income for a female-headed family at the end of October 1983 was $274 as compared to $426 for a family headed by a man.[14]

Apprenticeships provide women with an opportunity to learn a skilled trade while getting paid wages at much higher rates, higher than those to paid workers with substantial experience in many jobs traditionally held by women.

## ENTRY INTO THE TRADES

The historical development of many of the trade industries, particularly the construction industry continues to influence the access that women have to the trades.[15] The construction industry has been characterized by a proliferation of small and medium sized businesses which are oftentimes family-owned. The employment practices of these family-owned businesses are often shaped by custom.[16] Referrals and hiring is often conducted by word-of-mouth, with special consideration given to friends and relatives.[17]

There are basically two ways of entering the trades: the informal non-union route or the formal union route.[18] Individuals hired through the informal non-union route are generally hired directly from the community or an established recruitment or training organization.[19] White males find this informal route a viable means of obtaining a job because informal "old boy" networks inform prospective tradesworkers of job openings. Moreover, the presence of the "old boy" network or familial ties within the trades increases the likelihood that an employer will hire an unexperienced white male on the strength of a recommendation by a friend or relative. Women, however, rarely enter the trades through family connections or by applying directly to a contractor for a job, but rather through referral and placement services.[20]

In heavily unionized areas the method used most often by women to enter the trades is the union apprenticeship program.[21] As is true of the informal route, the access of women to apprenticeship programs is influenced greatly by cultural stereotypes and discriminatory barriers which tend to prevent women from becoming apprentices. Consequently, most women enter apprenticeships and thus the trades through federally funded recruitment and pre-apprenticeship training programs.[22]

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[6] Id.

[7] U.S. Commission on Civil Rights, "Unemployment and Underemployment Among Blacks, Hispanics and Women," 14 (1982).

[8] Id. at 6.

[9] Id. at 5. Underemployment is defined as only able to find part-time work, work which is inadequate to support a family; or work which uses fewer skills or less education than possessed.

[10] Special Studies Branch, Office of Federal Contract Compliance Programs, "Women in Construction" ii (1981) [hereinafter OFCCP Study].

[11] Women Employed Institute, "Working Women Challenging The Status Quo," 8 (1983).

[12] Id.

[13] Id.

[14] U.S. Department of Labor, Bureau of Labor Statistics, News (Oct. 31, 1983).

[15] OFCCP Study at 23.

[16] Id.

[17] Id.

[18] Id at 23.

[19] Id.

[20] OFCCP study at 56.

[21] Id at 56.

[22] Id at 20.

In 1982, 7 percent of all craft and kindred workers were women.[23] The term craft and kindred worker includes carpenters and electricians of whom women comprised approximately 2 percent in 1982; brick and stone masons of whom women comprised approximately. 7 percent; painters and construction maintenance workers of whom women comparised approximately 6 percent; and plumbers of whom women comprised. 8 percent.[24]

The small percentage of women and minorities when compared to their labor force participation demonstrates the need to increase the opportunities to enter these trades.

## THE NEED FOR CURRENT INFORMATION ABOUT APPRENTICESHIP PROGRAMS

There is presently no national information collection system for apprentices and apprenticeship programs in this country.[25] The latest generally available, nationwide statistics regarding female and minority apprentices by trades were compiled by the Bureau of Apprenticeship and Training through the State National Apprenticeship Reporting System (SNAPS) for the calendar year 1979. Current statistics for apprentices or apprenticeship programs are available only as national totals, that is, the total number of apprentices or apprenticeship programs at the end of a specific period.[26] Although State Apprenticeship Committees (SACs) and the Bureau of Apprenticeship Training (BAT) offices in states without SACs compile statistics on a statewide basis, the reliability of this information varies from state to state.[27]

We know from the dismal overall statistics that women have not been placed in apprenticeship programs in acceptable numbers. The problem cannot be dealt with effectively without accurate information about the number of women placed in apprenticeable trades. Detailed and accurate information about the apprentices themselves is essential to designing apprenticeship and training programs which address the special needs of women seeking nontraditional jobs. For example, improved documentation of attrition among female apprentices will assist apprenticeship placement directors in determining the extent to which such problems as sexual harassment increase the likelihood that women will not complete apprenticeship programs. Such documentation will also assist them in designing programs to address the problem.

## WOMEN IN APPRENTICESHIP PROGRAMS

Federal and state apprenticeship agencies recognize over 700 occupations as apprenticable.[28] There are currently approximately 50,000 registered apprenticeship programs nationwide.[29] At the end of October 1983, there were approximately 253,000 apprentices nationwide.[30] Women represented 6.6 percent of all apprentices nationwide.[31] The percentage of minorities which includes minority females was 20.2 percent. The relative progress that minority males have made in the skilled trades and craft apprenticeship demonstrates the effectiveness of goals and timetables which were implemented under Executive Order 11246 before goals were required for women in apprenticeship programs.

The total number of registered apprentices decreased from 323,866 in 1979 to 253,187 in 1983.[32] Although the percentage of registered apprentices who are female has increased steadily from 4 percent in 1979 to 6.6 percent in 1983,[33] the total number of registered women apprentices has actually decreased from 17,992 in 1981 to 16,754 in 1983.[34]

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[23] The percentage of minority craft and kindred workers was almost as low as the percentages of women (8 percent) craft and kindred workers. U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings January 1983.

[24] Id.

[25] Telephone conversation with Dan Burkitt, Program Analyst, BAT (Nov. 10, 1983); Memorandum to Leonora Cole Alexander, Director, Women's Bureau from Minor R. Miller, Acting Director of Bureau of Apprenticeship Training (Oct. 18, 1983).

[26] BAT has additional internal statistics which are not generally released to the public because they are considered to be very unreliable. Telephone conversation with Dan Burkitt, BAT (Nov. 10, 1983).

[27] Id.

[28] U.S. Department of Labor, Employment and Training Administration, "List of Occupations Recognized as Apprenticeable" (Mar. 11, 1983).

[29] Telephone conversation with Dan Burkitt, Program Analyst, BAT (Nov. 11, 1983).

[30] Id.

[31] Telephone conversation with Dan Burkitt, Program Analyst, BAT (Nov. 10, 1983).

[32] Office of Comprehensive Employment and Training, Bureau of Apprenticeship and Training (BAT), Washington, D.C. (summary of statistics presented to Women's Monitoring Committee for annual meeting).

[33] Id.

The same phenomenon is observed for minority apprentices. Although the percentage of registered apprentices who are minority group members increased steadily from 17 percent in 1979 to 20 percent in 1983, the number of minority registered apprentices decreased from 58,032 in 1981 to 51,075 in 1983.[35]

The combined statistics for Illinois, Indiana and Michigan in Region V indicate that for selected trades, a total of 84 percent of women apprentices are either carpenters or electricians.[36]

The State Apprenticeship Council for the state of Virginia reports a total of 6,340 apprentices of which only 755 are women.[37] Fifty percent of those few female apprentices in the State of Virginia are in the traditionally female jobs of cosmetology or cook apprentices.[38]

Most apprentices in 1979 (61 percent) were concentrated in the construction trades.[39] Although half of all women apprentices were in the construction trades in 1979,[40] women comprised only 3 percent of all apprentices in the industry.[41] Similarly, although 66 percent of all minorities [42] were concentrated in the construction trades minorities comprised 18 percent of all construction apprentices.[43] In 1979 a total of 49 percent women were apprenticed as either carpenters or electricians.[44]

These statistics indicate that although the percentage of women and minorities has increased, the numbers of women employed as apprentices are still exceedingly small and clustered in a few trades.

Unfortunately, even the modest gains made by women may be threatened by drastic reductions in funding for outreach and training programs and lack of civil rights enforcement by BAT.

### DRASTIC REDUCTIONS IN FUNDING FOR OUTREACH AND TRAINING PROGRAMS

As mentioned earlier, the informal networks which have traditionally been used to recruit and hire tradesworkers tend to exclude women from the skilled trades.[45] Consequently, women are forced to use alternative methods to gain access to the trades. Government funded outreach and training programs have played a vital role in increasing the access of women and minorities to apprenticable trades.[46] Outreach and training services are particularly important to the goal of increasing the numbers of female apprentices because women are more likely to be unfamiliar with career opportunities in the skilled trades than their male counterparts, because of sex-role sterotyping.[47] Many women need to learn of the advantages that nontraditional careers offer, and become familiar with the use of tools before they can seriously consider a nontraditional job as a career option.[48] Moreover, women often require additional support such as assertiveness training and counseling on sexual harassment.

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[34] Id.

[35] The number of minority apprentices decreased from 55,323 in 1979 to 54,855 in 1980 before increasing to 58,032 in 1981. Office of Comprehensive Employment and Training, BAT, Washington, D.C.

[36] Telephone conversation with Dan Burkitt, Program Analyst, BAT reporting Regional Apprenticeship Record Entry System for Region V (Nov. 14, 1983).

[37] Telephone conversation with Robert Bumgardner, Virginia State Apprenticeship Council (Nov. 14, 1983).

[38] Id

[39] U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship Training, Apprentice Registration Data for Calendar Year 1979 obtained through State and National Apprenticeship Reporting System (SNAPS) (June 22, 1981) [hereinafter SNAPS 1979].

[40] Id.

[41] Id.

[42] Included in the category of minorities are Black, Hispanic, Asian and American Indian persons.

[43] SNAPS 1979.

[44] Id.

[45] See discussion p. 5, supra.

[46] Id. See also R. Kane & J. Miller, "Women and Apprenticeship: A Study of Programs Designed to Facilitate Women's Participation in The Skilled Trades," (1977) (preliminary findings). The study of ten outreach-recruitment programs conducted in 1977 revealed that 80 percent of women who participated in an outreach-recruitment program were successfully named to eligible apprenticeship lists.

[47] See R. J. Associates, "Problems of Women in Apprenticeship" (1977); J. Miller and R. Kane, "Women in Apprenticeship: A Study of Programs Designed to Facilitate Women's Participation in the Skilled Trades" (1977) [hereinafter R.J. Study].

[48] Institute for Women's Concerns, "Women and Apprenticeship: A Study of Programs Designed to Facilitate Women's Participation in the Skilled Trades," (1977); R.J. Study.

There is currently only one federally funded nationwide outreach-recruitment program which serves women in the country: The PREP Inc. program which operates at five major sites. The funds for PREP Inc. were so drastically reduced in fiscal year 1982 that the program's Long Island site is now operating with a volunteer staff.[49] All other federally funded targeted outreach programs serving women are now closed.[50] Without the recruitment, training and supportive services provided by these programs, women will not increase their numbers in the high paying skilled trades.

### LACK OF ENFORCEMENT BY BAT

Although the Bureau of Apprenticeship Training is required to encourage State Apprenticeship Councils to enforce equal opportunity requirements for apprenticeship programs, the Bureau retains its authority to enforce equal opportunity as well.[51]

The Bureau of Apprenticeship Training is authorized to conduct systematic reviews of apprenticeship programs and investigations of complaints to determine whether apprenticeship programs comply with the requirements of the regulations governing apprenticeship programs[52] and impose sanctions against non-complying programs.[53]

Sponsors of apprenticeship programs are required to make a good faith effort to meet a goal of not less than 50 percent of the proportion of women in the workforce in the sponsor's labor market area.[54] In most areas sponsors are required to make a good faith effort to meet a 20 percent goal for female apprentices. Despite its obligation to ensure that sponsors of apprenticeship programs make a good faith effort to meet these goals, the Bureau of Apprenticeship Training has not enforced the 20 percent participation goal for women.[55] In addition, the Bureau of Apprenticeship Training rarely if ever imposes sanctions for violations discovered during a compliance review.

### OTHER CONSIDERATIONS

#### *Age*

Although the national standards for many apprenticeship programs no longer use maximum age limits to determine eligibility for admission to apprenticeship programs, the national standards set by many apprenticeship programs do not expressly prohibit local apprenticeship programs from using maximum age limits. These maximum age limits reduce the pool of women who are otherwise eligible for apprenticeship programs because women as a group tend to become interested in apprenticeable careers when they are older. Studies have shown that most women enter apprenticeships after they have already had some experience in the workforce.[56] Consequently, women seeking apprenticable trades tend to be in their late twenties, and early thirties. The Department of Labor regulation which provides that sponsors may waive upper age limits to meet affirmative action goals does not solve the problem.[57] Women who see the maximum age limit listed as an eligibility requirement or women who learn of the maximum age limit in other ways will be discouraged from applying for the program. This problem could become increasingly serious when federally-funded programs which previously recruited and encouraged older women, informed them of the waivers, and often obtained waivers for these applicants are forced to stop providing this service. Maximum age limits have been held to violate Title VII of the Civil Rights Act of 1964 when that eligibility requirement perpetuates past discrimination.[58] Maximum age limits for admission to apprenticeship programs should be prohibited.

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[49] Meeting with Lucy Green, Executive Director, PREP Inc. (Nov. 14, 1983).

[50] Meeting with Lucy Green, Executive Director, PREP Inc. (Nov. 14, 1983). The National Urban League's Labor Education Program (LEAP) and the Recruitment Training Program Inc. (RTP), and the Women in Apprenticeship Program Inc. in San Francisco, California were also closed.

[51] 29 C.F.R. § 30.15(a)(3)(1978).

[52] 29 C.F.R. § 30.1; 29 C.F.R. § 30.9 (1978).

[53] See 29 C.R.C. § 30.13 (1978).

[54] 29 C.F.R. § 30.4(f) (1978). See also Memorandum for BAT Regional Directors from James P. Mitchell, Administrator, BAT (Dec. 8, 1981) (Solicitor's Interpretation of 29 C.F.R. § 30.4(f)).

[55] See Letter from Lucy Green, Acting Chair, Women's Monitoring Committee to Raymond J. Donovan, Secretary of Labor (Dec. 13, 1982). The Women's Monitoring Committee was organized pursuant to a Consent Decree in *Advocates for Women* v. *Marshall*, Civ. Action No. 76-0862 (D.D.C.) to monitor the Department of Labor's enforcement of equal opportunities for women in nontraditional employment.

[56] *See* U.S. Department of Labor, "A Women's Guide to Apprenticeships" 4 (1980) (Pamphlet 17). See also, R. J. Study at 24.

[57] 29 C.F.R. § 30.4(c)(9) (1978).

*Harassment*

Hazing and sexual harassment by co-workers and supervisors is a major problem for women. At a conference of over 300 tradeswomen from the Midwestern states, hazing and harassment were major topics of discussion, and were often cited as the reason many women did not complete their apprenticeship programs.

The relationship between harassment and the attrition rates for of female apprentices should be studied. The Bureau of Apprenticeship Training should require sponsors to take responsibility for maintaining a work environment which is free from harassment. Sponsors who fail to make a good faith effort maintain a work environment which is free from harassment should be reported to Equal Employment Opportunity Commission and the Office of Federal Contract Compliance Programs, when the sponsor is a government contractor.

## CONCLUSION

Although the statistics indicate that women have increased their percentages among apprentices, the number of women employed as apprentices is still far too small. The access of women into the well-paid trades is in grave danger of once again being closed because programs which have been instrumental in increasing the number of women have not been funded.

Congress should reaffirm its national commitment to equal opportunity in apprenticeship trades by providing specific funding for outreach-recruitment and training programs which are essential to increasing the employment opportunities for women and minorities.

The Bureau of Apprenticeship Training has not enforced goals for women or maintained accurate and detailed statistics on the number of women in apprenticeship programs. A more effective enforcement scheme should be developed for the Bureau of Apprenticeship Training. The present sanctions lack serious consequences for many sponsors and are used by the Bureau of Apprenticeship Training too infrequently. While a more comprehensive enforcement scheme is being designed, the Bureau of Apprenticeship Training should improve its efforts to conduct compliance reviews and to investigate complaints.

Age ceilings continue to be a barrier for women. Other problems such as harassment by co-workers and supervisors threaten to drive women from their workplaces after they have crossed the first hurdle of becoming a certified apprentice.

I appreciate the opportunity to discuss the problems facing women in apprenticeship programs. I hope you will consider the issues that have been raised and the recommendations that have been made. I urge you to reaffirm our commitment to equal opportunity in apprenticeship programs.

Mr. HAWKINS. The next witnesses are from industry and will consist of Mr. John Bell, National Tooling and Machining Association; Mr. John Smith, Associated Builders and Contractors; Mr. Gary B. Warner, Associated General Contractors; and Mr. A. J. Phillips, National Electrical Contractors Association.

Would those gentlemen please be seated at the witness table?

Gentlemen, we welcome you and we look forward to your testimony. We have already indicated that all of the prepared statements will be entered into the record in their entirety. We would appreciate your giving us the highlights of your statements and leave time for some questions from the members of the committee.

We will begin with Mr. Bell of the National Tooling and Machining Association.

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[58] 42 U.S.C. § 2000e (1964). See *Stevenson* v. *International Paper Co.*, 10 FEP Cas. 1386 (5th Cir. 1975); *Pettway* v. *American Cast Iron Co.*, 7 FEP Cas. 1115 (5th Cir. 1978); *Judson & Judsoon* v. *Apprenticeship Training Council of the State of Oregon*, 4 FEP Cas. 747 (Ore. Ct. App. 1972); *U.S.* v. *Steamfitters Local 638*, 6 FEP Cas. 319 (D.C.N.Y. 1973). *See also Quinn* v. *N.Y. Electric and Gas Corp.*, No. 82-CV-716 (N.D.N.Y.) (1983).

[The prepared statement of John A. Bell follows:]

## PREPARED STATEMENT OF JOHN A. BELL, MANAGER OF TRAINING FOR THE NATIONAL TOOLING & MACHINING ASSOCIATION, FORT WASHINGTON, MD.

Good morning Mr. Chairman and Members of the Subcommittee:

### BACKGROUND

My name is John A. Bell. I am Manager of Training for the National Tooling and Machining Association (NTMA). Our industry represents 14,000 small companies in the tool, die and precision machining industry. These companies build special tools, dies, molds, die casting dies, jigs, fixtures, gages, special machines and precision machined parts and components. They use a wide variety of equipment and processes, including most machine tools, from the simplest lathe to the most complete electrical-chemical milling and electron-beam welding equipment, and lasers. They commonly achieve tolerances to one ten-thousandth of an inch and regularly use computers as an aid in design, machining and control of operations.

Our industry is literally the keystone of all manufacturing, serving virtually every other manufacturing industry, including those supplying the Department of Defense. The parts they produce range from the simplest to the most complex, including such critical jet engine parts as turbine blades. Most of them provide their services as subcontractors, bidding under open competition to provide original as well as spare parts for the Department of Defense. Congress on several occasions has noted that the tooling and machining industry is a basic industry upon which the economic welfare and security of the United States depends.

The tooling and machining industry, while noted as a capital intensive industry, in reality is selling skills and ingenuity. The sophisticated machines cannot be operated efficiently and effectively without a highly skilled and trained workforce.

Accordingly, one of the five principal NTMA goals has been:

"To develop a comprehensive structure for training on all levels."

To accomplish this broad training objective, NTMA has a well-organized, conscientious Apprenticeship and Training Committee composed of owners and managers who share their talents and expertise to improve industry-wide training.

Most of these owners rose through the ranks beginning as apprentices and they are keenly aware of the need for training.

NTMA has provided leadership and guidance for the entire industry on all training related matters. The Association publishes a wide variety of training texts, films and other teaching aids which are marketed throughout the world. NTMA has also gained substantial experience in the actual operation of training programs.

In 1964, the Association established itself as an innovative training organization through its now widely recognized, highly regarded pre-employment training programs. Nearly 16,000 persons have started training for career opportunities in the tooling and machining industry through this pre-employment program. This program pioneered the concept of pre-employment training. The program has conclusively proven that a highly structured, compressed pre-employment training program is a very efficient method of preparing people for job entry. This program concept has been copied by many other organizations and used effectively in many other trade occupations.

NTMA is nearing completion of a major overhaul of the entire training apparatus used throughout the tooling and machining industry. Early next year NTMA will introduce a comprehensive training package developed by industry specialists.

This first program, and subsequent programs for other metal working occupational specialties, will contain detailed daily lesson plans, work assignments and competency tests. It will be constructed on a modular basis for greater flexibility. This program will also be customized for use in public school systems thorughout the country.

### INTRODUCTION

NTMA appreciates this opportunity to testify before this Subcommittee of the House Labor and Education Committee. The purpose of these hearings is to examine the current "state of health" of the National Apprenticeship Act and the future outlook for education and training. There now seems to be a fairly general concensus that the American education and training system is not providing an adequate number of skilled people to maintain America's competitive position in the global economy.

At the outset I strongly recommend the Subcommittee's attention to several recent studies which have devoted considerable resources and talents towards examining the American education and training systems. The first study, titled "A Nation At Risk," was completed in April, 1983 by the National Commission on Excellence in Education and presented to the Secretary of Education. A companion report, titled "Education for Tomorrow's Jobs," is a more recent study, also completed at the invitation of the Department of Education, by the Committee on Vocational Education and Economic Development in Depressed areas. This second report devotes its entire attention to the problems and challenges facing vocational education.

A third study, titled "Human Capital: A High Yield Corporate Investment," warrants even more serious consideration. It was prepared by Dr. Anthony Patrick Carnevale for the American Society for Training and Development in an attempt to create a greater national understanding for the need to invest in human capital as a means of improving the overall performance of the American economy. The following significant citations from that report will give you a good overview of this theme and thrust:

"Educated, healthy, trained and spirited people are the ultimate source of economic growth. They are not simply the passive consumers of an autonomous and inhuman economic yield."

"People—not machines—are the wellspring of productivity."

"The historical dominance of the human factor in economic growth and productivity will persist and grow."

All three of these studies hammer home the point that our education and training systems are not functioning efficiently nor effectively. Each study contains significant suggestions and recommendations to solve the education and training problem.

The Fitzgerald Act was enacted in 1937, and it still constitutes the basic framework for federal involvement in apprenticeship. There are instances of state apprenticeship legislation predating that Act. However, it is apparent that the United States no longer has a clear cut strategy or policy on how to maintain and expand America's skilled work force.

During the past decade the major government emphasis has been devoted toward social uplift programs almost entirely. Some seem to believe that these programs will also solve the skills shortage problem. No doubt successful social uplift programs can help alleviate the skills shortage problem, but that effort alone has been and will continue to be inadequate to maintain and expand America's skilled work force. Until a comprehensive strategy or policy is developed, our resources and systems will not be properly focused and America will continue to relinquish its competitive position in the global economy.

## SPECIFIC RECOMMENDATIONS

NTMA suggests the following specific recommendations be woven into the overall fabric of a national strategy and policy directed towards maintaining and expanding America's skilled work force:

### *1. Tax credits for training*

Many proposals over the past dozen years have been raised seeking tax incentives to improve and widen training. Currently there is a bill before the House of Representatives (H.R. 897) on this particular measure. It was introduced in January, 1983 by Rep. Claudine Schneider.

Such a tax credit would be helpful and no doubt increase industry's training activities. The costs of training programs to the business community have accelerated tremendously. Rapidly advancing technology has pushed up the cost of training. However, the biggest cost accelerator is the fact that America's educational system is failing to provide people with basic skills. The business community must therefore devote considerable time and money to remedial education and training. Accordingly, until the education system remedies that failure, industry needs some type of financial support or incentive.

### *2. Educational assistance*

Employers provide substantial education and training assistance to their employees. This assistance is to advance and improve employee skills. There appears to be a growing debate whether or not this form of assistance should be taxable to the employee.

Any legislation which hinders or restricts this form of assistance will be a backwards step. There are presently bills in the House of Representatives and the

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Senate to extend the Educational Assistance Act (H.R. 2568 and S. 249). Those bills should be passed in their original form. Any amendments which would raise additional paperwork reporting requirements for employers, or affect the taxability of this assistance would destroy the intent and effectiveness of the legislation currently in place.

### *3. Federal committee on apprenticeship*

Although the Federal Committee on Apprenticeship (FCA) actually predates the Fitzgerald Act, the Committee, in recent years, has become more and more impotent. Before its recent year and a half hiatus, the Committee was unable to muster a quorum in most of its meetings over a period of several years. In those instances when the Committee submitted recommendations to the Secretary of Labor, they were more frequently ignored than acted upon.

Either the member compostion of the FCA or the operational guidelines should be changed so that attendees can act when they have a concensus. Furthermore, the FCA and the National Advisory council on Vocational Education should be required to maintain a regular liaison with one another. Both of these advisory groups have s substantial stake in all maters related to work-training.

### *4. Linkage programs*

During the past several years there seems to be little disagreement that education, industry, government and labor must collaborate and work together. There are a growing number of instances where these linkages have been developed with good results.

Several years ago NTMA developed a linkage proposal entitled "Open Road Program to Careers in Metalworking". This proposal was examined closely by the FCA. On two separate occasions the FCA recommended this NTMA linkage proposal to the Secretary of Labor for action. No action followed. Programs of that type, which integrate apprenticeship with secondary school education, should be pushed hard at the federal and state levels.

### *5. Apprenticeship registration*

Under present circumstances, requirements to register training programs either through the Federal Bureau of Apprenticeship and Training (BAT) or the appropriate state apprenticeship agency is more of a deterrent than an incentive to training. Business people increasingly rebel against federal/state interference and/or red tape. Furthermore, because of the BAT or state personnel makeup, the small business community, most of which is not unionized, fears that any involvement with registered apprenticeship activities will bring on "unionism". The underlying cause of that apprehension must be addressed.

It is widely recognized that a much larger number of people are being trained in unregistered programs compared to registered programs. Many of these unregistered programs are highly structured and sophisticated. They merit the same recognition and status accorded registered programs.

### *6. Curriculum/course content*

Many of the existing training programs in schools are based on curriculum developed years ago. Many programs embrace outmoded techniques and technology no longer used in the modern work place. Presently many trainees receive theory instruction on topics or techniques long after they have mastered them on-the-job or, conversely, far too soon before they receive hands-on experience. The related theory portion of curriculums should also be coordinated with on-the-job training activities.

All programs should be examined by industry experts and coordinated and updated to meet industry's needs of today.

### *7. Teacher/instructor competency*

Some states have procedures and mechanisms intended to insure that vocational teachers and instructors are, in fact, competent. However, a substantial number of those currently teaching vocational courses are not competent either because of long absence from industry, new technology, or because they never had the basic practical experience needed to instruct specific occupational skills.

Competency certification of all teachers and instructors should be mandatory on a regular periodic basis. Industry should be involved in developing those certification standards to insure competency.

*8. Length of training*

Traditionally apprenticeship programs have been heavily time-oriented. Apprentices were expected to put in a specified number of hours in the classroom and on the job. Over the years, the time spent in training became more important than the skills and knowledge acquired.

All programs should be reoriented and based on competency. Apprentices and trainees who demonstrate competency should be allowed to move ahead at a pace in keeping with their individual abilities rather than "putting in time."

### CONCLUSION

Thank you for allowing NTMA the opportunity to present some recommendations which should help strengthen training and restore America's competitiveness. The problems surrounding our training and education systems are substantial and severe. The system, as they were originally designed, can work. Unfortunately, modifications and interpretations have damaged the effectiveness of the system. Solutions must be found quickly.

NTMA stands ready and anxious to participate in any subsequent projects or programs which might improve quality of training and rebuild America's skilled work force.

## STATEMENT OF JOHN A. BELL, MANAGER OF TRAINING FOR THE NATIONAL TOOLING & MACHINING ASSOCIATION [NTMA]

Mr. **Bell.** Thank you, Mr. Chairman. It's a privilege to have an opportunity on behalf of the National Tooling and Machining Association for which I am the national training manager, to testify before this committee. I am not going to read my testimony. I am going to try to distill it into my own language and the prepared statement will stand.

A little background on the association. The industry that I represent is the tooling and machining industry. It is made up of approximately 14,000 very small companies that average about 25 employees. The association has been around since 1943. The industry itself has been classified in most emergency situations as an essential industry. The occupations that are employed in the industry—toolmakers, diemakers, moldmakers, machinists and so forth—have been classified as critical occupations.

The industry has a reputation and has a nickname of being called the keystone of all manufacturing, the keystone of all production. Congress on several occasions has classified the industry as a very basic industry on which the economic welfare and security of the United States depends.

The association has been very much involved in skills training since it was organized in 1943. As a matter of fact, one of the five goals of the association is to—I'll read it—"develop a comprehensive structure for training on all levels."

The association has had a very active Apprenticeship Committee since it has been organized. The Apprenticeship Committee is made up of owners of tool shops, machine shops, and mold shops across the country. Most all of these people are people who have come up through the trade, have served an apprenticeship and they know the value and the need for high skills training. The association has provided a considerable amount of leadership to the overall industry in its training needs and today the association and its chapters actually own and operate 10 training institutes in different parts of the country.

As I say, we, the association, have pioneered a training technique that has become quite popular in recent years called preemployment or preapprenticeship training and NTMA back in 1964 was probably the first national organization to be actively engaged in that type of experimental program. Since then many other organizations in many occupations have copied that type of training.

The preemployment training has proven to be a very, very effective tool of getting people prepared for jobs in today's world. The preemployment training program has been made necessary, unfortunately, because of some of the problems and failures of our own education and training systems as they exist.

The association right now is on the verge of making a major upgrade of the training apparatus that is used throughout the industry. By that I am talking about the curriculum materials that are being used in our own industry and used in the school systems. We have, the past 2 years, had a series of training experts from our own industry that have gone over all of the training materials and we are coming down to the point where we will have daily lesson plans, competency tests, and everything else that will be available for our industry as well as the school system.

We have made some major efforts on our own behalf to improve the training programs that we offer.

I would like to recommend to this committee serious attention to three printed reports that have come out in the last year and a half. They are referred to in my testimony. One of them I think everybody is aware of; it's called "A Nation at Risk," which addressed itself more to the academic problems that exist in our school system. The other report which came out just recently—there was a special meeting just a few weeks ago by the Department of Education on the report that's called "Education for Tomorrow's Jobs." This report focuses in on the vocational education system and some of the problems that exist there.

The third study, which I feel is equally if not more important is one that was produced by the American Society for Training and Development and the title is, "Human Capital: A High Yield Corporate Investment."

Those three reports, I think, contain a tremendous amount of valuable information that should be studied closely. I won't go into any of the details that are in there because I am sure that you can pick them up on your own and I am sure that some of the other witnesses have referred to them.

But I would like to just cite three passages from the "Human Capital: A High Yield Corporate Investment" report because I think it gives us a couple of very, very pungent thoughts here that we really ought to really keep our focus on. I would just like to read those for a second.

One of them says, and I quote, "Educated, healthy, trained and spirited people are the ultimate source of economic growth. They are not simply the passive consumers of an autonomous and inhuman, economic yield."

The second one, and I quote, "People, not machines, are the wellspring of productivity."

The third one, again quoting, "The historical dominance of the human factor in economic growth and productivity will persist and grow."

I think those three thoughts right there contain some very powerful things that we should keep in mind.

These studies really are talking about the problems that exist in our education and training systems and they offer a number of recommendations that I think we ought to pay close attention to.

I would like to switch to a few of the recommendations that the National Tooling and Machining Association would like to offer to the committee for consideration.

The first one is a tax credit for training. This association and industry has for years endorsed and sponsored activity that would result in some legislation to that effect. There is presently a bill before the House—H.R. 897—which was introduced this past January, that would provide tax incentives that would induce more training and improve the quality of training throughout the country. I would hope that some activity will develop from the passage of that legislation this year. There have been bills up on this measure for the past several years and they have not passed.

Industry needs some help, particularly dealing with the deficiencies of the young people coming into the work force. Industry has to do a tremendous amount of remedial training, and until that situation can be changed, I think we have got to do something to help industry to provide the remedial training. The tax credit training would be one of the ways of offsetting the growing cost of training people and preparing them for the work site.

Another item that we would like to address is the Education Assistance Act. That legislation is supposed to expire at the end of this year. There is a bill before the Senate and the House right now to extend that legislation, but I also understand that there are some amendments that have been proposed that, if they go through in the language that I have heard, I think will just about defeat the purpose of the act itself. It would be going to a lot of paperwork requirements and everything else that is going to be required and I think the whole thing would just fall.

I would also like to focus on another item which would be the Federal Committee on Apprenticeship. The Federal Committee on Apprenticeship actually predates the Fitzgerald Act; it was around before that act was passed. That committee over the years has provided a tremendous amount of guidance that has been acted on, but in the last 6 to 8 years our experience with that committee has been fairly dismal.

The committee was made up of industry, labor, and the public sector. Unfortunately, the past several years when they were meeting, and they have not met for the past year and a half, they were very frustrated in being able to take any official action because of the lack of a forum. I think something needs to be done to either restructure the composition of that committee or provide some new operational regulations under which that committee could function.

I think the other thing that needs to be done is that committee is intended to be an advisory committee to the Secretary of Labor and quite frequently many of the things that the committee recommended to the Secretary did not receive proper attention or adequate attention. I will refer to one specific piece later on in my own testimony.

I think the Federal Committee can provide tremendous backup to the Secretary of Labor. A tremendous amount of talent has been brought into that committee. They have been very, very fortunate in having some very knowledgeable people and I think they should be paid attention to a lot more than they have been.

I would like to talk for a second about linkage programs. I think everybody is in agreement, I don't think there is any debate on the point that education, industry, labor, and the Government have to work together. I think that's probably been the intent all along, but the fulfillment of that hasn't been realized.

There are a number of examples in the recent years of some linkage programs that have worked out quite effectively. I think that that needs to be looked at very, very closely—those exemplary situations that have worked, I think we need to copy those and we need to do something aggressively, positively that will push those linkages more to the surface and get more of them operating.

This association, the National Tooling and Machining Association, proposed such a linkage program several years ago and it was reviewed by the Federal Committee on Apprenticeship on two separate occasions. They debated the merits of that particular proposal and voted that it should be acted upon by the Secretary of Labor. The Secretary did nothing on either of those occasions. What I am referring to is the inaction on the part of the Secretary sometimes to the recommendations of that committee.

That particular proposal is one that we still have. It is being followed, and some of the sample linkage programs have been successful. We have called it "the Open Road Program for Careers in the Metalworking Industry." We would like to see more of those types of programs which integrate apprenticeship into the secondary school system acted on. We need to do more of that.

I would like to talk for a few minutes about apprenticeship registration. Apprenticeship registration in theory is a good concept. In actuality, I think today it is probably more of a deterrent than an encouragement to industry, particularly small industry, to register their programs.

The small business community is becoming more and more sensitive. They rebel more and more every day to any interference or redtape that has connections with the government, either Federal or State. I think that's a problem that we have got to face up to and we have to do something about it.

I think one of the other problems with registration is something that needs to be recognized. I don't have any particular recommendations on how to solve it, but it is a problem that needs to be recognized. Small industry in particular, which is basically nonunion, does have an apprehension for registration because they associate registration with possible unionization or union involvement. That is a fact that you can't ignore and I think that you have to address yourself to that when you talk about registration.

When you talk about registration I think one thing that we must keep in mind, and it has been pretty well documented—our figures vary but they are substantial—the number of unregistered people in training probably exceeds those that are in registered programs. Now how large that overage is I don't know. There are no hard figures on unregistered training activities, but it is substantial and some people have put the figure as high as $30 billion a year that industry spends on programs that are in-house type programs that are not registered with the Bureau or the State agency.

Another item that I would like to address for a second is curriculum and course content. Our school systems and many of the industry-sponsored programs, I think, less there than in the schools, but I think they are both at fault, a lot of the training programs that are going on today are being conducted under curriculum guidelines that were set up many, many years ago and don't really address themselves to the new workplace technology that exists today. Outmoded techniques, outmoded activities are being taught to students that are no longer used in industry and I think what we need to do is to make a very, very close scrutiny of materials that are being used in any particular system and make sure that they are up-to-date and teaching the technology that needs to be taught today.

I suggest that industry be heavily involved in any scrutiny, any examination, any attention that is given this matter because I am convinced that if you rely on the professional educators, the academic people to do this for you you will have more of what we already have, which is outdated techniques and outdated technology being taught. Industry knows what they need and basically are the people that should govern the content of those programs. They are the ones who are hiring the people out of the system.

Along the same lines is teacher and instructor competency. I would like to talk to that topic for a second. Today, particularly in the school systems—in the secondary schools and the community colleges we see it all the time—the teachers that are supposedly competent to teach a particular occupational skill are not. I think something needs to be done to set up competency certification for teachers and instructors. We should not allow people into any classroom or teaching situation if they are not prepared to teach the particular skill that they are attempting to teach. There are far too many examples of people who have been out of the trades for 15, 20, 30 years in the classroom teaching techniques that are that old or older. That needs to be addressed. It's a serious failing on the part of what is going on out there.

Another point and the final point that I would like to make is the length of training programs. I know there is considerable debate on this. There are different sides to this issue, but we have found—we have proven it some years ago in our own industry—we ran some experimental programs to compress the length of time for training. Typically, most apprenticeship programs are about 4 years. There are some that are less than that and there are some that are more than that, but typically an apprenticeship program runs 4 years.

We have found that training programs that typically are four years in our trade can be compressed into at least three years and we feel very strongly that, given a little bit more experimentation that we will get it down to 2 years. That's an item that needs to be addressed because the length of training, I think, is a significant thing in the completion rate. I think people who are in programs and studying in classrooms, being "taught," theoretically, and I put taught in quotes, being "taught" subjects that they have already been exposed to several years before in the on-the-job training aspect of their program, it's a big incentive to get out of the programs. I think that's something that we need to address is compressed programs into a realistic timeframe, make the programs competency oriented rather than time oriented.

I would like to conclude my comments on those points and just close with a statement that the National Tooling & Machining Association has been very much involved in training for its own industry for a long time. We feel that we have made a lot of progress; we have got a lot of progress yet to be made. We would be very anxious to work with the committee or any other agencies that might be designated to improve some of the items that we have just addressed here to help rebuild America's skilled workforce.

My comments today were addressed to the skilled workforce specifically, because our industry really is selling its skilled, innovative techniques; that's really what they are selling.

I would like to close my comments there.

Mr. HAWKINS. Thank you, Mr. Bell. The next witness is Mr. John Smith, Associated Builders & Contractors.

[The prepared statement of John Smith follows:]

### PREPARED STATEMENT OF JOHN B. SMITH, FOR THE ASSOCIATED BUILDERS & CONTRACTORS, INC.

My name is John B. Smith. I am President of Lake Plumbing, Inc. in Eustis, Florida. I am currently serving as Chairman of Associated Builders and Contractors' (ABC) National Education Committee. ABC is a national construction trade association representing over 16,000 members who subscribe to the Merit Shop philosophy. The Merit Shop philosophy (simply) is a concept which calls for open competitive bidding, with contracts awarded to the lowest qualified bidder.

Before I begin my testimony, I would like to take this opportunity to thank you for the invitation to address this Committee. On behalf of ABC I wish to express our support of apprenticeship training and all forms of craft training. As we are progressing from the 1980's to the 1990's, we see how vital craft training is to the future of the construction industry. Open shop contractors have made substantial gains in the volume of business performed on an annual basis. Fifteen years ago open shop contractors were performing only 20 percent of the actual volume each year. Today, open shop contractors are completing nearly 70 percent of all construction projects. We have utilized apprenticeship training as a very appropriate and efficient means of training our young craftsmen. We are very serious about craft training as demonstrated by our multi-million dollar project called the Wheels of Learning. The Wheels of Learning will provide task-oriented, competency-based, modular programs in 22 construction trades once completed. Initiated in 1979, we have now completed 24 individual, 150 hour programs in 10 construction trades, which include the recently completed 4 year (600 hour) courses on Electricity and Plumbing and a 2 year (300 hour) curriculum on welding. By this time next year 5 more trades will be completely finished and subsequently the next two curriculums will be complete in 1985.

The key point I wish to make is this—ABC supports the Bureau of Apprenticeship and Training (BAT) and the language of the Fitzgerald Act of 1937. Furthermore, we object to the concept of "liquidating" the BAT agency and turning over control to local State Apprenticeship Councils (SACs). This is not to say that BAT could not stand some improvement. We are not totally satisfied with the Bureau of Apprenticeship and Training, and sincerely believe modifications should be made which would turn this agency into a more responsive, objective and purposeful body. Conversely, we are convinced that a network of SACs could never be as effective or efficient.

Our support of the BAT is deep-rooted in our concern for all forms of craft training which includes apprenticeship training. The enactment of the Fitzgerald Act of

1937 modernized and consolidated a time tested method of training for this nation. Apprenticeship training throughout history and today has proven to be a very advantageous training option for both the employer and employee. The benefits are as follows:

1. Apprenticeship is efficient while still being comprehensive. The on-the-job training (OJT) has always been emphasized, with most programs in the construction trades lasting 3-4 years (6,000 to 8,000 hours). The utilization of 144 hours of direct classroom training each year makes apprenticeship comprehensive. The OJT may show a trainee how to work in a trade, but the classroom instruction teaches "why" things are performed as they are.

2. There are not many opportunities for an individual to learn about his/her chosen vocation, while at the same time earning a good living in the same trade! Apprenticeship affords a young employee the opportunity to become a productive taxpayer and learn marketable skills. An apprentice's time is usually his/her biggest investment. Additionally, although the employer's expense to train an apprentice is significant, he is receiving some productivity from the young employee/trainee. More importantly, the nation's taxpayer gets the real bargain. Most costs of apprenticeship are absorbed at the private sector level, although the government does supplement apprenticeship instructor wages.

3. Apprenticeship training is a solid, time-tested option a contractor can utilize in the development of a skilled workforce. The training is thorough and is steeped in tradition. The completion of a bonafide apprenticeship training program is as prestigious and important as a graduation from an accredited college.

Apprenticeship is still popular. There have always been more applicants than there were opportunities and apprenticeship is no longer for the individual who was considered too weak (academically) to go to college. Strong math and language skills (reading and oral) are vital ingredients for a successful apprenticeship.

Because of these three factors, ABC supports apprenticeship training. Furthermore, ABC supports the Bureau of Apprenticeship Training as the governmental agency best suited to administer, coordinate, promote and advise this nation's apprenticeship program. Our support of BAT stems partially from our grave concern with State Apprenticeship Councils. Let me explain our uneasiness regarding SACs and the possible chaotic and devastating consequences of instigating a national network of SACs.

Many SACs are politically motivated. Under the guidelines of the Fitzgerald Act of 1937, local states were allowed the option to implement and conduct their own SAC as sanctioned by BAT. Approximately 30 states have chosen to establish SACs. The Council usually consists of State appointed members who represent management, labor and the public; it in turn works with a staff of state employees in the day-to-day administration of the programs. BAT at this point takes on an advisory role.

In 1937, the union's were active in apprenticeship. The open shop sector's role was virtually nonexistent. As a result, the union label has been entrenched in most SACs. The labor representatives are often represented by union business agents, management by union contractors and the public by someone who has little or no experience in apprenticeship training.

Consequently, representatives of open shop training programs are met with adversarial confrontation when attempting to develop, implement and register new apprenticeship programs. There are exceptions to this rule, but the majority of SACs got bad marks from ABC. This is a significant issue when considering open shop contractors represent nearly 70 percent of today's construction market.

Our criticism of SACs (in general) is based on one other reason besides the aforementioned overt and prejudicial discrimination towards the open shop contractors. Namely, SACs are not standardized. Interstate contractors prefer working with BAT because they can more easily transfer their apprentices along with other employees to jobs outside of their home state. SACs have no reciprocity with one another. The District of Columbia does not even recognize programs registered in the Maryland SAC. A national network of SACs such as this would result in a horrendous war of "turf protection" and the eventual death of apprenticeship. Contractors could no longer afford to employ apprentices or fight the "red tape battle of the century."

I must point out ABC's support of this federal government agency is contrary to our general philosophy. ABC supports President Reagan's stand for decentralization of federal government and giving more control to the states in every way, except on the issue of apprenticeship training. In this instance, the concept of autonomous state run programs is unworkable.

Therefore, BAT can provide consistency and continuity. It can be more objective and open-minded than most SACs, not to mention operating more effectively while being less burdensome to the taxpayers.

On the other hand, BAT is not perfect and changes are warranted. I would like to share my recommendations and concerns:

1. BAT must move away from the traditional concept of time based training and toward the concept of competency based training. In looking at the overall training needs of this nation, what is more important, the length of an apprenticeship or the acquisition of journeyman skills? It's skills! Using time as the benchmark is archaic thinking.

I am glad to report that the National office of BAT accepts and supports this philosophy, but that is not enough. BAT should be the spearhead behind developing competencies for the industry. A standardized list of competencies in each trade would improve and ensure quality of all apprenticeship graduates.

BAT must recognize other formats of training as viable avenues towards the pursuit of skilled craftworkers. Task training emphasizes hands-on skills training. It allows an employee to be productive very quickly and it affords him/her an opportunity to develop a variety of marketable skills in a rapid manner. As merit shop contractors, we wish to support an individual's growth in his/her chosen vocation according to his/her aptitude, attitude and level of motivation. We need BAT's support, otherwise the success of apprenticeship is in jeopardy. I support this argument with the following evidence:

ABC's completion rate for apprentices is 35 percent while only 17 percent (according to 1979 BLS report) of union apprentices become journeymen. ABC's completion rate is higher (most likely) because we approve credit for an applicant's previous experience and education and allow for accelerated advancement based on merit. Completion rates could easily be doubled, and the quality of apprentices who graduate would not be jeopardized in the least, *if* an apprentice (faced with a four year apprenticeship) could take advantage of a competency based, marketable skills oriented program. This would allow the apprentice to advance through his/her apprenticeship based on ability, ambition and aptitude, rather than a formula of 8,000 hours of OJT and 144 hours of classroom training that was developed at the turn of this century.

Furthermore, the opportunity to learn marketable skills that ensures job security and advancement would appeal to the kind of trainees we wish to recruit into our programs. The industry has changed in 40 years. It's time BAT adjusted.

BAT must further move away from recognizing trades the way unions do and forcing open shop programs to utilize the same criteria. A trade should be identified by marketable skills. The recognition of the metal building assembler classification was a step in the right direction, but we must go further. Why not a classification for general construction workers? Why not a classification for a forming carpenter? Why not let the industry set the standards and length of training?

By modernizing BAT in these ways, this agency can become (once again) responsive to the industry's training needs.

I also have some serious concerns. In 1981 there were 459 BAT officials throughout the United States. Today there are only 291. It is no surprise that apprenticeship enrollments have decreased from an estimated 324,000 in 1979 to the 253,000 of today. The premeditated reduction in staff is killing apprenticeship in the United States. SACs are not picking up the slack and BAT states are losing their ability to promote and advise on issues regarding apprenticeship and training. Stop the reduction. Fill the vacant positions. Allow BAT to be the responsive agency it is capable of being.

I think much of the criticism of BAT today would have never begun had we kept a full force of BAT officials. How can 291 officials provide the same service that 459 once provided? BAT used to conduct a national census of apprenticeship called the State and National Apprenticeship Systems (SNAPS). We no longer have this valuable service and those involved in apprenticeships want it reactivated. This incidently, would probably be a service lost forever if a network of SACs was institued.

On another issue, the Federal Committee on Apprenticeship (FCA) was once a vital group—recommending national policy concerning apprenticeship. The FCA has been virtually dormant. FCA should be reactivated and members of this committee should represent all facets of the industry to ensure objectivity and jurisprudence.

The FCA, or possibly BAT, could also be of great assistance when a group or individual has an unsolvable problem in regard to apprenticeship and training. The establishment of an "appeals procedure" could provide an avenue for anyone to pursue who has a grievance with a local BAT or SAC. This process should be easy and economical. In this manner unresponsive and prejudicial BATs and SACs (through its relationship with a "fair and objective central agency") would be compelled to live within the guidelines established in the Fitzgerald Act. If power were unconditional and attached to the state funding, this procedure could be effective, resulting in strong and vibrant apprenticeship training programs.

I also see an opportunity for BAT to expand its "horizons." The Job Training Partnership Act (JTPA) may be able to strengthen apprenticeship through pre-apprenticeship. A cooperative effort to initiate and utilize pre-apprenticeship training programs will not only better prepare the nation's unemployed and displaced workers for a career in construction, but would reward those who support apprenticeship training and groups targeted by JTPA.

In conclusion, the implementation of ABC's suggestions would make BAT stronger and more efficient. We need a Bureau that is not only open but supportive of creative and innovative ways of better training our craftsmen in a more timely manner. The Bureau of Labor Statistics has documented that our current pace of training individuals is inadequate to meet critical shortages in the 1990's. There is more than one way to develop journeymen within the construction industry and the Bureau of Apprenticeship and Training must recognize this. With the incorporation of our suggestions, outlined in this testimony, I believe that BAT can be molded once again into a vital agency within the federal government. It could be an agency that not only provides guidance and support but also could be a clearinghouse for information regarding statistics and figures on apprenticeship and training in the United States.

ABC is a strong supporter of the free enterprise system and private sector involvement. By lifting a few burdens from our backs, the Bureau of Apprenticeship and Training can help us to do our job better and help the United States prosper as well. Therefore, we would like to see these improvements initiated and incorporated. We know there are many dedicated staff people at the state, regional and national offices within the Bureau of Apprenticeship Training. We appreciate their help and their concern. We support any changes that would help us train more people more effectively and efficiently whether it be apprenticeship training, task training, or any other innovative training method.

As a businessman and as a member of the Associated Builders and Contractors I wish government to be responsive and supportive, not burdensome and counterproductive. As an American, I want innovativeness, ingenuity and creativity to be our hallmarks as we face the future. That takes flexibility and open-mindedness. Under proper direction the Bureau of Apprenticeship and Training can satisfy our needs, those of the industry and of this nation.

## STATEMENT OF JOHN SMITH, PRESIDENT OF LAKE PLUMBING, INC., EUSTIS, FLA., AND CHAIRMAN, NATIONAL EDUCATION COMMITTEE, ASSOCIATED BUILDERS & CONTRACTORS [ABC]

Mr. Smith. Good morning, Mr. Chairman, gentlemen.

My name is John B. Smith. I am president of Lake Plumbing, Inc., in Eustis, Fla. I am currently serving as chairman of the Associated Builders & Contractors' National Education Committee. ABC is a national trade association and it represents over 16,000 members in 77 chapters who subscribe to the merit shop philosophy. The merit shop philosophy simply is a concept which calls for open competitive bidding with contracts awarded to the lowest qualified bidder.

Before I begin my testimony, I would like to take this opportunity to thank you for the invitation to address this committee and on behalf of ABC I would like to express our support of all apprenticeship in all forms of craft training. As we are progressing from now the 1980's to the 1990's, we see that craft training is going to be very important to the future of the construction industry. Open shop contractors have made substantial gains in the volume of business performed on an annual basis and at present are completing nearly 70 percent of all commercial, institutional, and industrial construction projects.

We have utilized apprenticeship training as a very appropriate means of training our young craftsmen and we are very serious about craft training, as demonstrated by our multimillion dollar project curriculum called the wheels of learning. The wheels of learning would provide task-oriented, competency-based, modular programed instruction in 22 construction trades when it is completed.

I guess perhaps the key point I wish to make is this: That ABC supports the Bureau of Apprenticeship and Training and we support the language of the Fitzgerald Act of 1937. Furthermore, we object to the concept of eliminating the BAT agency and turning control over to local State apprenticeship councils.

This is not to say that BAT couldn't stand some improvement. We are not totally satisfied with the Bureau of Apprenticeship & Training, but sincerely believe that modifications can be made which would turn this agency into a more responsive, objective, and purposeful body.

Conversely, we are convinced that the network of SAC's or State councils could never be as effective or efficient. My written testimony explains our arguments and suggestions in great detail, but I would like to take a few minutes to cover some main points.

Again, ABC strongly believes that craft training is vital to our industry, specifically apprenticeship training which provides many benefits. Apprenticeship training is efficient and comprehensive because it combines on-the-job training with classroom training and affords a new employee the opportunity to earn a living while learning a trade. Also apprenticeship training is a solid option a contractor can employ in order to develop the number of skilled craft workers this industry is going to need in the very near future.

ABC believes that the Bureau of Apprenticeship and Training is the most qualified Government agency and is the most capable of adequately administrating this Nation's apprenticeship programs. Our reasons for BAT support are many. BAT can more objectively and efficiently handle a program that oversees hundreds of thousands of apprentices and do a lot better job than a network of State councils.

ABC is quite critical of most State apprenticeship councils for several reasons. First, State apprenticeship councils are normally politically motivated. The councils are often composed of union business agents, union contractors, and members representing the public that have little or no experience in apprenticeship. These appointed officials as a result tend to restrict or hold back our open shop training programs and so we come to have an adversarial relationship with most State councils.

There are exceptions to this rule, however, because we do enjoy good working relationships with several State councils. But the SAC's that we are able to work with are far outweighed by other ones. Councils who refuse to support open shop involvement in apprenticeship training do hurt us a great deal.

If, in a network of SAC's the mentality existed nationwide, it would really just about totally eliminate open shop involvement in registered apprenticeship programs. We feel like this is a grave issue when considering that open shop contractors represent nearly 70 percent of today's construction workers.

Second, SAC's [State apprenticeship councils], are not standardized. Contractors working from State to State prefer working with BAT because they can more easily transfer the apprentices along with other employees to jobs outside of their home State. State councils have no reciprocity with one another. For example, the District of Columbia doesn't even recognize the programs registered in Maryland.

A national network of State councils such as this would result in a tremendous war and eventually in the death of apprenticeship for our contractors. The contractors could no longer afford to employ apprentices and fight this redtape battle.

I must point out that ABC's support of the Federal Government agency is contrary to our general philosophy. ABC supports President Reagan's efforts for decentralization of Federal Government, giving more control to the States in just about every way, except this one issue of apprenticeship training. The concept of autonomous, State-run programs is unworkable. BAT can be more effective and less costly with a better sense of fairness. On the other hand, BAT does need improvement and I would like to share some of our concerns and recommendations.

We would like to see BAT move away from the traditional concept of time-based training. What's more important? The length of an apprenticeship or the acquisition of journeyman skills. It's skills—it's skills using time and when you use time as a benchmark, it's just archaic thinking.

I am glad to report that the national office of BAT accepts and supports this philosophy, but that is not enough. BAT should be the spearhead behind developing competencies for industry. A standardized list of competencies for each trade would improve and insure quality of all apprentice graduates.

BAT must also recognize other formats of training as viable avenues toward the pursuit of skilled craft workers. Task training emphasizes hands-on skill training. It allows an employee to be productive very quickly and it affords him an opportunity to develop marketable skills in a rapid manner.

As merit shop contractors we wish to support an individual's growth in his or her chosen trade according to their aptitude, their attitude, and level of motivation. We could use BAT's support. Also we would like to see BAT move away from recognizing trades the way that unions do and then force open shop programs to use the same criteria. A trade should be identified by marketable skills. The recognition of the metal building assembler, which BAT has approved, was a step in the right direction but we must go further.

Why not have a classification for general construction workers or a carpenter who builds forms and let the industry participate in the selection standards and length of training? I also have some serious concerns. In 1981 there were 459 BAT officials throughout the United States and today there are only 290. It's no surprise that apprenticeship enrollments have decreased from an estimated 324,000 in 1979 to 253,000 today. This reduction-in-staff is hurting apprenticeship in the United States and State apprenticeship councils are not picking up the slack and BAT States are losing their ability to promote and advise on issues regarding apprenticeship and training. Let us stop the reduction, fill the vacant positions, and allow BAT to be the responsive agency it is capable of being.

We also feel that the Federal Committee on Apprenticeship was once a vital group, recommending national policy concerning apprenticeship. This committee has been virtually dormant. It should be reactivated and members of the committee should represent all facets of the industry to insure objectivity and jurisprudence.

An appeals procedure should be established to provide an avenue for any individual or organization who has a grievance with the local BAT or a State council to come to a place for help. This procedure should be within the national BAT office with possible involvement by the Federal committee and an unconditional authority should be given to BAT to properly resolve all issues.

I also see an opportunity to expand its horizons. The Job Training Partnership Act may be able to strengthen apprenticeship through preapprenticeship, a cooperative effort to initiate preapprenticeship training programs will not only better prepare the Nation's unemployed and displaced workers for a career in construction, but would reward those who support apprenticeship training and the employment of the groups targeted by this Job Training Partnership Act.

In conclusion, BAT has not sufficiently changed with the times and the industry. Its staff has been reduced by 50 percent over the last 4 years. The positive effectiveness of the Fitzgerald Act of 1937 has been watered down because of this and the existence of politically motivated State councils.

BAT, however, can do the job if molded to fit the needs of our Nation and the construction industry is going to face a shortage of 2 million journeymen by 1990. A modernization of our concepts of training will help us to meet this demand.

We would like to see the words "supportive", "progressive", "flexible", "innovative", "objective", "competent", and "responsive" be the list of adjectives used to describe BAT. Let us remove the terms "burdensome", "prejudiced", and "bureaucratic". As a businessman, a member of ABC and an American, I know the free enterprise system works and giving rewards based on merit works. Under proper direction BAT can help us do the job we need to get done.

Mr. HAWKINS. Thank you, Mr. Smith.

The next witness is Mr. Gary B. Warner.

Mr. JEFFORDS. Mr. Chairman.

Mr. HAWKINS. Mr. Jeffords.

Mr. JEFFORDS. I would like to introduce Gary. He comes from one of the world's best construction companies which just happens to be located in Vermont. That's probably why it is one of the best. More than that, Gary, as well as the Pizzagalli Bros., have been actively involved not only in the private sector but the public sector and I want to commend you and all of the family for the tremendous work that you have done in the public and the private sector. It's a pleasure to have you before us here.

Mr. WARNER. Thank you very much, Mr. Jeffords.

[The prepared statement of Gary Warner follows:]

## PREPARED STATEMENT OF GARY WARNER, THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, SOUTH BURLINGTON, VT.

My name is Gary Warner. I am Director of Administration for Pizzagalli Construction Company of South Burlington, Vermont. I am Chairman of the Open Shop Subcommittee of the Associated General Contractors of America's Manpower and Training Committee. I am here today representing AGC and am accompanied by Chris Engquist and John Heffner of the AGC National Staff.

AGC believes that construction craft training programs must follow a competency-based approach with each individual progressing at a rate commensurate with a demonstrated ability to perform, as opposed to a specified length of time. Further, the related instructional portion of craft training should be conducted at off-site locations to ensure a more formal and planned approach to training. Training for the construction industry should be developed and managed by the industry with the government role restricted to encouragement rather than management.

It is also AGC's position that construction industry training should make optimum use of existing resources and maximize the return on training investment through integration with our vocational education system. Innovations such as the pre-planned, joint utilization of physical training facilities and shared use of equipment and professional expertise are examples of how industry and public education can blend their resources to the mutual benefit of all, especially the traineee or apprentice.

AGC has adopted as its mission "to foster, promote, develop and implement policies, procedures and programs in such a manner as to develop an adequate supply of qualified workers in the most expeditious, economical and practicable manner." To help meet this objective, AGC has submitted to the Department of Labor "Bureau of Apprenticeship and Training Criteria for Approval of Unilateral Trainee Programs" and "Labor Standards for Training Programs." These two proposals, which will improve and add flexibility to registration procedures. will be discussed in greater detail within this statement.

### COMPETENCY-BASED TRAINING

The acceptance and utilization of competency-based training by the construction industry will serve to systematize often disjointed training mechanisms. Our current training systems do not in all cases produce craft workers who meet the quality skill standards required on the job site. Within a competency-based approach to training, all skill achievement is certified by written and actual performance tests. By administering performance testing under simulated on-site conditions, the ability of an individual to perform specified competencies is documented.

Based on Bureau of Labor Statistics estimates of 1980, the construction industry at large will require a total of 900,000 new craft workers by 1990, in addition to replacements for the 1.5 million vacancies that will be created through attrition. Present training programs deliver approximately 60,000 workers to our industry annually. It is obvious that even with present expansion of instructional programs, existing training mechanisms cannot meet the demands within this decade.

In terms of sheer numbers, the ability to reduce the period of apprenticeship through a competency-based method facilitates the training of significantly larger numbers of workers within shorter time spans. It is AGC's position that both union and open shop construction craft training programs benefit from the adoption of a competency-based training approach.

Aside from establishing a more efficient vehicle for construction training in general, competency-based instruction provides a better means to facilitate the entry of females and minorities into the industry. With certified skills attained over minimal periods of time, females and minorities can represent to the construction contractor an available manpower resource which can be based on skills and not arbitrary quota requirements established by the federal government. Having been evaluated against performance standards, such a manpower pool represents trained craft workers capable of functioning on a job site and seeing a project to completion. Competency-based training also permits the varying rates of advancement necessary to maintain the enthusiasm of the slower-than-average and the faster-than-average trainee.

### OFF-SITE TRAINING

In conjunction with performance based on training, a primary aspect of AGC's training philosophy is off-site training. An off-site training system is one in which the individual receives classroom and field training away from the job-site. The training facility should provide a simulation of job site conditions for manipulative skills training and classrooms for training in the theoretical aspects of a skill. This training system should include a logical and sequential system that enables apprentices and trainees to move from the classroom to the field or training site and to the job site. They are thus provided with gradual and individual development based on their abilities.

### MODULAR TRAINING

A modular training system is one in which there are short term units of training in specific skill areas which, when combined with an off-site training system, provide several advantages over more traditional systems.

The utilization of an off-site modular training system enables an individual to learn quickly by providing an atmosphere where training is concentrated with less opportunity for distraction and therefore greatly enhanced learning retention.

A modular system is also highly adaptable to market demands with the individual concentrating on needed and saleable skill areas. In addition, modular training enables better utilization of training system resources and permits apprentices, trainees, and instructors to measure progress based on demonstrated competencies in specific skill modules. The overall impact is greater efficiency and effectiveness than is the case in traditional time-based systems.

The modular system is also based upon the individual developing minimum productivity levels within reasonable periods of training. The individual is working, learning, and simultaneously earning a wage commendurate with the contribution. Thus, unit labor costs do not increase out of proportion to the abilities of the apprentice or trainee.

There are several methods of funding modular off-site systems. As there are for any training system, the initial costs are exepnsive because of the physical facility requirements. However, in the long term, the costs of establishing a modular, off-site training system have been more than offset by the considerably greater benefit to the training program, the trainee and the industry.

Modular off-site training is not just a theory. It is being utilized in St. Louis, Portland and throughout the country in both the union and open shop sectors of the cosntruction industry, and its use is growing.

### TRAINING MATERIALS

AGC has developed training materials, including curricula for carpenter, bricklayer, cement mason, millwright, construction craftsman and heavy equipment operator, which are designed for use in competency-based, modular, off-site systems.

In addition, AGC has supported the development of performance-based training materials in the union sector of the industry. The training system entitled the Performance Evaluated Training System, or PETS, utilized by the International Brotherhood of Carpenters, and the Training Standards Project utilized by the International Union of Operating Engineers, are successful examples of this support.

The AGC Model for Unilateral Trainee Program Standards, approved by the Bureau of Apprenticeship and Training in 1980, is a further example of a modular, competency-based training approach, which AGC is promoting among open shop members.

### THE FEDERAL GOVERNMENT AND TRAINING

AGC would like to see the Department of Labor and the Bureau of Apprenticeship and Training (BAT) actively promote modular, competency-based training. Although AGC experienced some initial difficulty in registering performance-based training programs at the federal level, we have had better cooperation from the Bureau of Apprenticeship and Training in recent years. This is not the case in many states with State Apprenticeship Councils where approval of unilateral and competency-based programs can be difficult and often impossible.

Currently, the Bureau of Apprenticeship and Training and the State Apprenticeship Councils, in those states which have them, monitor and approve training programs. This division of responsibility has produced conflicting results. In the present context of State and Federal Davis-Bacon laws, and in order to establish uniform policies, procedures, and standards, AGC feels that BAT should possess singular authority within the areas of program approval, registration, and monitoring of industry sponsored training programs.

Despite an increasing acceptance of modular, competency-based training at the federal level, AGC believes that further training innovations are possible and desirable. Recently AGC submitted two proposals to the Department of Labor to revise and improve training standards for registration of apprenticeship and trainee programs. The first, entitled "Bureau of Apprenticeship and Training Criteria for Approval of Unilateral Trainee Programs" seeks to establish permanent competency-based standards for registration of unilateral trainee programs. The second, entitled "Labor Standards for Training Programs," seeks to modify existing registration policies and standards for apprenticeship and trainee programs. The primary focus of the proposals is to permit program registration for marketable occupations, rather than traditional crafts. This would give employers the flexibility they need to train workers for today's and tomorrow's needs.

## VOCATIONAL EDUCATION AND TRAINING

The issue of the role of vocational education is also deeply involved in solving the training problems facing the construction industry. Because vocational education is not being adequately utilized, a large source of trained or partially trained manpower for the construction industry currently lies virtually untapped. A chasm, which AGC and many educators are attempting to bridge, exists between our industry and the vocational education system. Coordination can produce much more than each system operating independently.

Vocational education can, through pre-training, pre-apprenticeship and screening functions, produce well prepared candidates. If the vocational education community adopted performance-based instruction, the system could produce apprentices or trainees with advanced standing based on an objective assessment of prior training.

Since construction training and vocational education are both highly decentralized networks, the problem of communications has hindered cooperation. It is essential that working relationships at the local level be established. Leadership in this endeavor must be exerted at the national level, however, to produce an environment conducive to this cooperative effort.

In any future legislation, it would be wise to give consideration to the promotion of cooperation between vocational education and apprenticeship and training for the construction industry. Administration of both programs by one agency may be a worthwhile alternative.

AGC has established its own liaison with vocational education including establishment of a joint committee with the State Directors of Vocational Education and close relationships with the American Vocational Association and the Vocational Industrial Clubs of America.

## ELEMENTS OF SUCCESSFUL TRAINING

The following represent AGC's views relative to creating an effective and expedient training system designed to facilitate increased training and worker productivity, while optimizing accessibility to construction skills for all.

1. The overall objective must be the development of a training system which will provide an adequate supply of qualified workers.
2. Apprentice and trainee programs must be available in all geographic and craft areas.
3. Entry into a program must be possible from all societal levels and sectors.
4. Basic (non-worksite) training should be a requisite to on-site employment.
5. Entrance criteria reflecting aptitude and educational achievement level sufficient to progress in a realistic training program must be utilized.
6. Apprenticeship and training and upgrading training must be primarily concerned with development of a saleable skill.
7. Training must be relative to, and commensurate with, the skills required in the marketplace.
8. Off-site training must be relevant and timely with on-site experiences.
9. Training time frames must be commensurate with the training and the individual's ability to progress.
10. Accelerated entrance and advancement in apprenticeship and training programs must be permitted on the basis of performance testing.
11. The training system must utilize today's educational and communicative technology, media, and methodology.
12. Multi-craft apprentice and training centers simulating a construction site environment should be utilized. Establishment and use of these centers must be predicated on the premise of off-site academic and manipulative training within a controlled environment, and on-site experiences for development of proficiency and productivity

13. Labor organizations must be permitted to refuse dispatch of a craftsman who is not certified for the specific skills required.

14. Employers must be permitted to refuse employment of a worker not certified for the specific skill required.

15. The existing apprenticeship system must be preserved in order to assure an adequate supply of master craftsmen who are qualified in all aspects of a trade.

16. Local sponsors or State Apprenticeship Councils must be precluded from imposing requirements in local standards which deter, whether in spirit or in fact, the basic philosophy and objectives set forth in the national standards.

17. Local standards must set forth the criteria that constitute a saleable skill in a given area so as to establish eligibility of program certification.

18. Standards must not provide a maximum eligibility age. Minimum age should be sixteen or as required by State or Federal law.

19. National apprenticeship and training standards should:

A. Determine what minimum subskills are a prerequisite for certification of a given skill training program,

B. Provide universally validated competencies and performance testing and a systematic approach to the training process.

20. Performance criteria must include scope and quality.

21. Accreditation reciprocity must prevail among training programs, which permits enrollees in apprenticeship and training programs to move from one geographic area to another with full credit.

22. Uniform subskills and reciprocity for same must be provided to permit apprentices to change their selected skill occupations and retain credit for that portion of completed training which is common to a newly-selected skill occupation.

23. Standards should provide the minimum criteria for qualified training personnel.

In conclusion, we feel there are a number of specific steps which can be taken that will help ensure efficient and effective craft training for the construction industry. Present instructional methodologies have advanced to the point that we no longer need to rely upon the traditional, time-based, textbook or on-the-job approaches to train our workforces. It is time to implement those innovative, but proven, methodologies that we have outlined.

## STATEMENT OF GARY WARNER, DIRECTOR OF ADMINISTRATION, PIZZAGALLI CONSTRUCTION CO., SOUTH BURLINGTON, VT.

Mr. WARNER. Mr. Chairman and members of the subcommittee, it's a pleasure for me to be here today on behalf of the Associated General Contractors of America. As you know, my name is Gary Warner and I am a vice resident with Pizzagalli Construction Co. of South Burlington, Vt. I am also the chairman of the Open Shop Subcommittee of Manpower and Training for the Associated General Contractors of America.

AGC believes that construction craft training programs must utilize a competency-based approach where each individual progresses at a rate commensurate with a demonstrated ability to perform. We believe that the related instruction portion of craft training should be conducted at outside locations to insure a formal, planned approach.

Training for the construction industry should be developed and managed by the industry. The Government's role should be one of encouragement rather than management.

Construction industry training should also make optimum use of the existing resources such as integration of industry programs with vocational education. Joint utilization of physical training facilities and shared use of equipment and professional expertise are examples of how industry and public education can blend their resources.

The acceptance and utilization of competency-based training by the construction industry can help systematize existing training mechanisms.

In addition, the ability to reduce the training period through a competency-based method assists in the training of large numbers of workers within shorter time spans. AGC members believe that both union and open shop construction craft training programs benefit from the use of competency-based training. Competency-based training also permits the varying rates of advancement necessary to maintain the enthusiasm of the slower-than-average and the faster-than-average trainee.

Aside from establishing a more efficient vehicle for construction training in general, competency-based instruction provides a better means to increase the entry of females and minorities into the industry.

With skills attained over lesser periods of time females and minorities can represent a known-skilled manpower resource and not a requirement established by the Federal Government. In conjunction with competency-or performance-based training, two primary aspects of AGC's training philosophy are modular and off-site training. An off-site training system is one in which the individual receives classroom and field training away from the job site. The training facility provides simulation of the job site conditions for manipulative skills, training, and a classroom for training in the theoretical aspects of his skill. A modular training system is one in which there are short-term units of training in specific skill areas which, when combined with an off-site training system, provide several advantages over more traditional systems.

The overall impact is greater efficiency and effectiveness than is the case in traditional, time-based systems. The individuals are working, learning, simultaneously earning a wage commensurate with their contribution.

Modular off-site training is not just a theory. It is being utilized in St. Louis, Portland and throughout the country in both the union and open shop sectors of the construction industry and it's use is growing.

The AGC has developed training materials, including curricula for a carpenter, bricklayer, cement mason, millwright, construction craftsman, and heavy equipment operator, which are designed for use in competency-based, modular off-site systems. In addition, AGC has supported the development of performance-based training materials in the union sector of the industry. The training system entitled "the Performance Evaluated Training System" or PETS utilized by the United Brotherhood of Carpenters and the Training Standards Project utilized by the International Union of Operating Engineers are successful examples of this support.

The AGC model for unilateral trainee program standards approved by BAT in 1980 is a further example of a modular, competency-based training approach which AGC is using with its open shop members.

In terms of the Government's role in training, AGC would like to see the Department of Labor and the Bureau of Apprenticeship and Training actively promote modular, competency-based training. Although AGC experienced some initial difficulty in registering performance-based training programs at the Federal level, we have had better cooperation from BAT in recent years.

This is not the case in many States with State apprenticeship councils where the approval of unilateral and competency-based programs can be difficult and sometimes impossible.

Currently the BAT and the State apprenticeship councils in those States which have them monitor and approve training programs. This division of responsibility has produced conflicting results. In the present context of State and Federal Davis-Bacon laws and in order to establish uniform policies, procedures and standards, AGC feels that BAT should possess singular authority within the areas of program approval, registration, and monitoring of industry-sponsored training programs.

Absent a workable alternative, AGC is concerned that the reduction of manpower and funding at BAT severely limits the ability of that agency to carry out these responsibilities to the detriment of our industry.

Despite an increased acceptance of modular, competency-based training at the Federal level, AGC believes that further training innovations are possible and desirable. AGC has submitted two proposals to the Department of Labor to revive and improve training standards for registration of apprentices and trainee programs.

The first, entitled, "Bureau of Apprenticeship and Training Criteria for Approval of Unilateral Trainee Programs" seeks to establish permanent competency-based standards for registration of unilateral trainee programs.

The second, entitled, "Labor Standards for Training Programs," seeks to modify existing registration policies and standards for apprenticeship and training programs. The primary focus in the proposal is to permit program registration for marketable occupations rather than traditional crafts. This would give employers the flexibility that they need to train workers for their particular needs.

The role of vocational education can also contribute to solving the training problems facing the construction industry. Vocational education is not being adequately utilized. AGC and many educators are attempting to increase linkages between our industry and the vocational educational system.

Administration of vocational education and training by one agency may be a worthwhile alternative. AGC has established its own liaison with vocational education including a joint committee with the State directors of vocational education and close ties with the American Vocational Association and the Vocational Industrial Clubs of America.

In conclusion, we feel there are a number of specific steps which can be taken that will help insure efficient and effective craft training for the construction industry. The present instructional methodologies have advanced to the point that we no longer need to rely upon the traditional time-based, textbook or on-the-job approach to train our work force.

It is time to implement the innovative proposals we have outlined. Thank you.

Mr. HAWKINS. Thank you, Mr. Warner.

The next witness and the final witness on this panel is Mr. A. J. Phillips of the National Electrical Contractors Association.

Mr. Phillips.

[The prepared statement of Andrew J. Phillips follows:]

### PREPARED STATEMENT OF A. J. PHILLIPS, THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, WASHINGTON, D.C.

My name is Andrew J. Phillips. I am the Director of the National Joint Apprenticeship and Training Committee (NJATC) for the Electrical Contracting Industry and have been Assistant Director and Director for 20 years.

By way of background, this office is jointly sponsored and financed by the International Brotherhood of Electrical Workers which represents approximately 200,000 construction electricians and the National Electrical Contractors Association which represents some 5,500 electrical contractors.

The NJATC was established after the passage of the Fitzgerald Act and has provided national staff to assist the 375 local joint apprenticeship and training committees in carrying out their responsibilities in the most efficient and effective way consistent with the needs of the Industry to better serve the public in conformity with existing laws and regulations.

To accomplish this we prepare and make available national course instructional materials, conduct teacher training seminars, committee operation seminars and provide labor-management services which keep the local JATCs with a singular purpose of producing an adequate number of fully qualified and competent journeymen to serve the public interest—our customer, and meet our Industry's needs.

The input of apprentices fluctuates with the economy; however, over the years we have averaged an input of approximately 7,000 apprentices per year and maintained a four (4) year program consisting of approximately 25,000 apprentices at any given time. This effort has produced approximately a quarter of a million journeymen since the existence of the NJATC and represents approximately 10 percent of all registered indentured apprentices.

In addition, this office supplies training materials and services to promote journeyman training activities designed to avoid obsolescence in the workforce and assure the consuming public of the highest degree of worker competence in a changing and increasingly complex industrial society. Today, for example, a large percentage of this Industry's 375 programs are using NJATC prepared materials to provide journeyman training in fiber optics, electronics and programmable controllers employing the use of microprocessors which are used in robotics.

The NJATC works diligently to maintain joint labor-management operations in the fullest sense of the word. In this instance; however, since the IBEW is addressing this Committee separately, I have been asked by the National Electrical Contractors Association to speak on their behalf in response to the invitation from this Committee.

Prior to the Fitzgerald Act only a few states had regulations concerning apprenticeship. Interest in promoting apprenticeship on the part of the individual states was lacking prior to National interest created, promoted and directed as a result of the Fitzgerald Act. I believe that it is historically accurate to state that the Congress in their wisdom saw a deep depression in which training opportunities were virtually nonexistant and anticipated the coming of World War II in which we would have a shortage of skilled workers. Passage of the Fitzgerald Act proved to be of great importance to the apprenticeship system and very much in the interest of national defense. Expecting individual states to accomplish goals of such national magnitude and importance would have been unrealistic. Without the BAT, U.S. Department of Labor there would not exist the uniformity in the quality of training the nation requires to meet its manpower needs.

The enabling provision of the Fitzgerald Act recognizing State Apprenticeship Councils has been utilized by 32 states and territories. The experience of this Industry has been excellent in working with both the BAT and State Councils. We believe; however, that it would be a disservice to the system for the federal presence to be weakened or eliminated. It is logical to assume that the states, absent the uniformity of federal regulation, would differ widely in their concept of apprenticeship. Differing apprenticeship laws, regulations and procedures would reduce the opportunity for nationally based Industries to conduct uniform apprenticeship and training programs. Without uniformity the mobility of well trained workers could be limited.

Uniformity through national standards and procedures and the support of national organizations working with the Bureau of Apprenticeship and Training, U.S. Department of Labor is directly responsible for the high degree of success we have experienced in producing a competent mobile workforce capable of converging on large construction projects in any part of the country with the assurance that workers are equally trained and competent to meet the requirement of the customer, be it private enterprise or national defense projects.

In summary, we believe the appenticeship system could best be served if proper consideration were given to the following:

1. A strong national presence (BAT) with which national programs can work and cooperate to produce national apprentice systems. For the state to carry out the administrative part of this responsibility would be workable but uniform policy must be established by federal standards.

2. Since 1964 the publicity and interest in the apprenticeship system has been out of proportion to the number of jobs available. The Industry presently has 15% minority participation in apprenticeship and is making reasonable progress under difficult conditions in accomplishing female participation. I would add that this has been accomplished in the electrical construction industry at the expense of the Industry without receiving any federal funds. Efforts by the Federal Government to "pay" entities to sponsor apprenticeship programs have been less than successful, inequitable and should be discontinued.

3. Apprenticeship could best be served by making a distinciton between education and training. Presently there is a great emphasis on activities such as trainees, preapprenticeship, etc., which places the burden of education on JATCs which are ill equipped to accomplish. At the same time large sums of educational moneys have been allocated to teach manipulative skills in our educational system which often fails to produce qualified applicants. This results from the lack of realistic experience which can be gained only through productive employment. In fact, viewing the world of work as an educational excercise may be one of the problems with declining productivity. Schools should educate—industry must train.

4. Since apprenticeship is a free (to the apprentice and to the public) training opportunity leading to excellent employment opportunities, it is logical that large numbers of people would seek admission. It is not unusual for JATCs in the Electrical Industry to have as many as 25 applicants for each available job. This Industry has a well structured Selection Procedure but the amount of time required by joint committees, which serve without pay, to process the large number of applicants, eliminating many and choosing few, has serious financial and legal implications. In other words the number of jobs is finite and the number of applicants varies widely with the economy, the amount of publicity, the excessive notification required and other factors. Regulations could be modified to give relief in this area.

5. For apprenticeship to accomplish results that program sponsors and the public are entitled to, it must be viewed as a complex and demanding discipline in which people enter without skills and in four years receive the related knowledge (classroom work), manipulative skills (job experience) and more important the drive, pride and motivation to achieve and maintain excellence. To accomplish this, joint committees must be permitted to have screening tools such as educational prerequisites, valid aptitude tests and other means which are presently in existence but are always under attack and often viewed improperly by the courts.

In conclusion, the world and the country is getting smaller, not larger, and mobility is much more a factor in the workforce than it was in previous generations. Action to improve uniform training and mobility should be increased not decreased. I realize that apprenticeship, like most entities, means different things to different people, and that the responsibility of the Congress is to represent all segments. I beieve that it is in the best interest of our society that apprenticeship and training begin once again to be viewed as a private labor-management responsiblity, less subject to the buffeting of all external forces that have been experienced in the last 20 years. The public would realize reduced tax costs, better productivity and better products produced by competent workers. Industry carries on large training responsibilities with most of their employees on a continuing basis without being subject to all of the probiems that seem to beset those that sponsor registered apprentice training programs.

I appreciate the opportunity to present our views to you and I would be glad to answer any questions that you may have.

## STATEMENT OF A. J. PHILLIPS, DIRECTOR, NATIONAL JOINT APPRENTICESHIP AND TRAINING COMMITTEE OF THE ELECTRICAL CONTRACTORS ASSOCIATION

Mr. Phillips. Thank you, Mr. Hawkins.

Panel members, I am inclined to throw away all of my presentation here and do something else, but I better stick to the plotted course.

As you stated, I am Andrew Phillips and I am director of the national joint apprenticeship and training committee for the electrical contracting industry. By way of background as to whom I represent and how many individuals, in which you might be interested, the International Brotherhood of Electrical Workers has approximately 200,000 construction electricians that work in the construction industry. The total membership is 1 million, but I am involved with approximately 200,000.

The National Electrical Contractors Association, which is a management organization, represents some 5,500 electrical contractors across the country.

Our training entities, on a local basis, are subsidies subdivisions of these two parent organizations and we have some 375 local joint committees, which at any given time have indentured under their supervision approximately 25,000 electrical apprentices. The input each year is approximately 7,000. It varies with the economy. But over the years it averages about 7,000, and with some attrition, we end up with about 25,000 apprentices at any one time.

Most recent BAT figures indicate that there has been traditionally something like 250,000 indentured apprentices on an annual basis. So I think that our input to that total represents about 10 percent of the total indentured apprentices at any one time.

You know, we talk about apprenticeship and that last 4 years, and if somehow we don't motivate people to participate in continuing education, we could get into a situation of skill obsolescence. So a large part of the activity of our office is to promote state-of-the-art training, advanced training and journeyman training on a continuing basis. At the present time we have a national program in training in fiber optics, electronics, programmable controllers, microprocessors and all of the basics for robotics which is going to be one of the things that we will have to be prepared to face in the future.

I find myself in a little bit of a unique situation here because I am the director of the national joint apprenticeship and training committee. That's a joint labor-management operation and I think the degree of success that we have enjoyed has been because we have approached apprenticeship and training from that basis, strictly a joint operation. It's not a situation where employers pay into a fund and unions control it or that type of thing, but truly, truly joint.

When you can approach things in that way, then the training effort can be separated from the more selfish motives of both organizations and we try to keep—contractors' profits are most important. The National Electrical Contractors Association has never put producing an adequate number of fully qualified persons detrimentally in regard to profit motives. It's a separate thing and our job has been to produce the people that we need to have to man this industry.

I would point out that although it is a joint operation solely, Mr. Edwards has spoken on behalf of the IBEW and the committee's invitation to the National Electrical Contractors Association for input, they asked me if I would speak for them. So, in this instance, I am addressing you on behalf of the National Electrical Contractors Association.

The issue of the BAT and its role in respect to the State councils' I have addressed with a brief paragraph and by way of background, I think the Fitzgerald Act—prior to the Fitzgerald Act—there were only a few States that had any legislation with bearing upon the apprenticeship system. The State of Wisconsin has an apprenticeship law that goes back to 1911, but Milwaukee was a machine tool center and a lot of European customs and apprenticeship was much more known to those tradesmen so they had an interest and did certain things. But, in general, where apprenticeship training existed, it existed without the support or opposition of legislation. It was a private matter that people entered into if they saw fit.

I think that the Fitzgerald Act may have come from—this is just my opinion—but I have always believed that in a sense it was a National Security Act. When it was passed in the mid-thirties in the deep depression there was very little construction work going on, there were no jobs for people who presently had the skills and there was no input of youth or of new blood into the system so the skilled work force was diminishing in number rather than increasing.

I think in 1936, 1937, 1938, it was pretty apparent that there was a war going on and we could be involved in it. So, I believe that the BAT's role as it was created was to do things to encourage an input into an industry and produce people that we would vitally need in a short period of time. My personal opinion is that's what happened and I think that's just as important today as it was then.

It's rather hard to believe that we have massive unemployment and at the same time have manpower shortages and probably what government could best do would be find ways to match those things together and find some solution. I don't know how you do that. It's a big job, but it does exist. They are people begging for jobs and jobs begging for people.

I think that the Fitzgerald Act proved to be of great importance to the apprenticeship system and I think we need it very much in the national defense. Expecting individual States to have done that, I think, would have been unrealistic.

So yet the Fitzgerald Act provided for State participation in this process. The enabling provision of the Fitzgerald Act recognizing State apprenticeship councils has been utilized by 32 of the 55 States and territories, leaving what—23 States that are BAT States. We have no quarrel with either one. We have worked with great success with both the Bureau of Apprenticeship and Training and all State councils.

I believe, however, that it would be a disservice to the system for the Federal presence to be diminished or to disappear. I have no quarrel with State councils doing the administrative work for apprenticeship, but there certainly has to be a Federal presence. I think to do away and leave it up to the States to pass whatever rules or regulations that they saw fit would create a nonstandard condition that would make it impossible for national industries to conduct apprenticeship and trainee programs.

I think the success of our program has been that we have a national program and it's made it possible for us to have as large degree of standardization across the country.

Much has been said about vocational education, preapprenticeship, remedial education, and all of these things. We have tried in our industry to be self-sufficient. We have produced an apprenticeship system that you may call a "cradle to the grave" kind of situation in that we provide our programs with the complete apprenticeship package. They have standards of operation, they have selection procedures, trust fund agreements, a nationally standardized curriculum which we have staff that works on it constantly.

Obsolescence is not a problem with us because we don't have to wait for an appropriation of State or Federal money to change our curriculum; we do it on a continuing basis. The National Electrical Code is revised every 3 years and to incorporate the new provisions of the code and take advantage of the economics of one revision, we revise our material each 3 years, with subsequent minor revisions in between times, if it becomes necessary to do so.

So, we have a standardized—and I hate to use the word here after what I have heard—time-based curriculum. I would like to point out that I don't believe that the BAT has any reason to take a position on any type of curriculum that an industry would choose to use. I don't see that as a legitimate prerogative of administration. If people have questions, they should have information with which they could advise people, and I am sure that for many industries and for many programs it may be a proper thing to do, but I hate to see an idea conveyed that one is good and the other one is bad, that one should be selected and the other should be eliminated because there are differences between industries.

I think the reason that we have no problems with a time-based curriculum is the tremendous number of applicants that we have for apprenticeship. In many instances—we had one city last year that opened apprenticeship applications for four 4-hour periods on 4 consecutive days and took 2,026 applications for jobs that were practically nonexistent; they didn't even know whether they could start any apprentices or not, but they had to be prepared if there was a change in the work picture.

So I think what makes time-based curriculum useful and workable is the selection ratio that your industry can enjoy. Now we produce a national curriculum, and because we have a national curriculum that's logical that committees would have to select people with certain prerequisites. So we decided the prerequisites—an offer for their consideration for local adoption. If they get the right kind of people with the right kind of aptitude that could be measured very successfully with aptitude tests; if they have the proper educational background; if they have the proper motivation, drive, willingness, interest to succeed and to take advantage of the opportunity that has been given them, then we have few problems.

The reason—if you are going to have low entrance requirements and you have few applicants for apprenticeship, it's logical that you are going to get a spread of people with abilities ranging from marginal to excellent. We feel that when we sit down at the interview table and apply aptitude testing, educational prerequisites, evaluate transcripts, see how the individual did in school, that the people that we select—the 10 out of 100 or the 100 out of 1,000—are very similar in ability, we don't have that spread across the board that would make it possible to modify and adjudicate your training efforts to accommodate the slow learner without holding back the one that is capable. We have no problem with a time-based entity. I would hate to see it go any other way.

I find that when you set standards, when you set expectation levels for people, they perform. Left up to their own devices and their own pace—I am not concerned about the excellent people anyplace; they will always be excellent; I am concerned about the others—we set the pace for them, we don't let them set the pace. With proper selection, we don't have too many problems with bringing that about.

The uniformity, through national standards and procedures and the support of the national organizations working for the Bureau of Apprenticeship and Training, has given us the success that we have enjoyed. I think what's important is that we have to have standardization because today we have electricians that go from all 50 States and converge on huge projects in certain areas, whether they be private enterprise or national defense projects, and certainly we can't say that a person from Delaware does electrical work one way and from New Jersey does it some other way and from California another. I would hate to get us to where we had to have a Montana electrician to do a certain job that's in the public interest and in the national interest.

So, in summary, I have some points here—specific points that I would like to present to you for your consideration and I will read those because I put a little bit of thought into wording them.

One, I think a strong national presence, the BAT, with which national programs can work and cooperate to produce national apprenticeship systems, is necessary. For the State to carry out the administrative part of this responsibility would be workable, but uniform policy must be established by Federal standards.

Two, since 1964, the publicity and interest in the apprenticeship system has been far out of proportion to the number of jobs available. The industry presently has over a 15 percent minority participation in apprenticeship and for making reasonable progress under difficult conditions in accomplishing female participation.

What I mean by—I will answer a question perhaps before it is asked—what I mean by "under difficult circumstances" is we have difficulty in getting sufficient numbers of applicants from females to meet the goals. Mr. Petri, who isn't here now, mentioned a while ago the carrot. I think a carrot is only effective if it's held within sight of whatever you are trying to entice. When we have a 20 percent goal and we get, perhaps, 5 percent of our applicants that are females, it would be pretty unrealistic. So we are making progress in that field, but it has been slower than the minority input. We have about the same mix of minorities in our apprenticeship today that you see in the grocery store or on the street and that, I think, is about what should be expected and I am proud of the progress we have made.

They are members of a union, they have a future ahead of them, they are capable, our dropout rates have been commensurate with nonminorities and the reason this is so is because of the selection that we have enjoyed—the entrance requirements and the prerequisites. I might add that we have had to defend those every day. There is always someone that wants to shorten apprenticeship, throw out every requirement, throw out every barrier that they see to be a barrier and the first thing you know you have destroyed a system—and apprenticeship is a system. It's not a bunch of individual opinions. It's something that you have to agree on and give to to get out of.

Three, apprenticeship can best be served by making a distinction between education and training. Presently, there is a great emphasis on activities such as trainees, preapprenticeship, et cetera, which places the burden of education on JATC's, which they are ill equipped to accomplish.

At the same time, large sums of educational moneys have been allocated to teach manipulative skills in our educational system, which often fails to produce qualified applicants. This results from the lack of realistic experience which can be gained only through productive employment. In fact, viewing the world of work as an educational exercise may be one of the problems with declining productivity. We believe that schools should educate people.

Personally, I don't want any school counselor influencing my children to make a lifetime commitment to some occupation when they are 12 years old. I had a daughter that was in tears because she felt like she was a misfit. She couldn't say what she wanted to be. I had to go up and talk to the school counselor. I haven't made up my mind yet what I want to be and I don't want anybody telling me what I want to be. We need freedom in this country, not pushing people into molds.

Four, since apprenticeship is a free—to the apprentice and to the public—training opportunity leading to excellent employment opportunities, it is logical that large numbers of people would seek admission. It is not unusual for our JATC's to have 25 applicants for every available job.

The industry has a well structured selection procedure, but the amount of time required for joint committees which serve without pay to process these applications eliminating many and choosing few, has serious financial and legal implications. In other words, the number of jobs is finite. You can't lower entrance requirements and increase advertising and do all of the things that you are required to do and start more apprentices. The number of jobs available determines the number of apprentices.

The amount of publicity, the excessive notification required, and other factors—notifications could be modified to give relief in this area.

In conclusion, I think the world and the country both are not getting smaller, but larger. Mobility is much more of a factor than it used to be. I worked at trade and I remember to go across half a State was just almost an impossible thing to even envision and now we have journeymen jump on a jet plane and on the job Monday morning 2,000 or 3,000 miles away.

So, we need more standardization in our industry. Conditions dictate it. We have a National Electrical Code which is modified somewhat by State and local political entities. But we have national manufacturers. We need a national apprenticeship system.

I have other things to read here but I think I have exhausted my time and you've been very patient with me. I appreciate the opportunity to have addressed you and if there are any questions that I might be capable of answering, I'd be glad to do that.

Mr. HAWKINS. Thank you, Mr. Phillips.

Let me begin the questions with you because your testimony seems to differ from those of the other panel. And it seems to differ rather sharply. You seem not to worry about the term "competency" in terms of training, as seemed to be implied in a shorter period of time in your particular instance. I assume you support the idea of a 4-year program as opposed to a shorter period of time, and also seem not to be worried about the idea that there are a lot of jobs waiting for individuals and therefore it's necessary to get apprenticeships in and out in a hurry. Do I read correctly that interpretation?

Mr. PHILLIPS. Mr. Hawkins, what I intended to say was I don't think 4 years is a magic number. I think every industry should decide through job analysis what their occupations and trades consist of and I think you should have a reasonable amount of time to do that in. In our instance we used to have 5-year programs in the electrical construction industry. We reduced it to 4 years.

Apprenticeship, traditionally, has been an educational process coupled with job experience. That's what has made it so successful. You learn how to do the things on the job. You learn why you're doing them and the theory of doing it, which enhances productivity and ability in related instruction.

So, you can have as many hours in a period of time as you choose in related instruction. The job thing is finite. You only work so many hours a year. So that really determines the length of apprenticeship. We could compress our related instruction into 2 years by requiring them to go to school more hours per week and this type of thing. But absent some national defense motive for producing a large number of tradesmen in a shorter period of time, I ask people why, why.

I think most of our apprentices, you leave it up to most of our apprentices, I don't think they'd want the short period of apprenticeship. I think they welcome the opportunity to learn. And I've often wondered why contractors are so impatient to pay people journeyman's scale prematurely, if they pay journeyman's scale.

If the scale is whatever they arbitrarily decide, then there would be no reason not to push people through the system as fast as possible. I think probably an apprentice—I wish we could devise a way so they had to study all of their life, not consider the apprenticeship the end of a road and so on.

Mr. HAWKINS. Then you are saying, in effect, that the setting of a period of time does not reject the idea of competency as being still the guide?

Mr. PHILLIPS. Not at all, sir. Competency, any program that doesn't produce competency isn't worth conducting. We gather job information from our employers. You see, I think I sound like I'm about the only person here that has some kind of a union feeling. But where you have——

Mr. HAWKINS. You may detect that correctly. [Laughter.]

Mr. PHILLIPS. I think what we're saying with training is that an agreement is not just an agreement between management and labor. It's not just a labor agreement. It's an agreement among employers as to how they will conduct an apprenticeship activity. And it's binding on them.

We have rotation in our industry. Our committees are in control of apprenticeship. They take an apprentice from this employer and put him with that one, make both of them mad sometimes. But they do it on a basis of experience that's necessary. We monitor their experience through the 8,000 hours on the job and make sure that they acquire competency in that area.

Our class related instruction is very much controlled and we can guarantee competency in that area. Now, a lot of trades, and I'm not criticizing them—everybody should do what they think does best for them—but there's a tendency to bring parts of that job into the classroom and teach it there. A lot of our programs would like to do that. I discourage it because they have 8,000 hours out on the job, with journeymen, with productive work, to learn the manipulative skills of the trade.

The 576 hours which develops the mind, I think you have to guard that time jealously.

We have run surveys and most of our contractors that have responded to our surveys have no quarrel with the degree of manipulative skill at the end of 4 years. Some of them have quarrels the guy can't read blueprints the way he should, he doesn't know enough about control work, he doesn't know enough about electronics. I put him on jobs, he can do 90 percent of the work, but he lets me down on 2 percent of it.

Mr. HAWKINS. I was going to ask one of the other witnesses to comment on the same subject in order to give some balance. Does any of the other witnesses at this time care to make a comment on the same question?

Mr. SMITH. I think that the only problem we have with setting limits is that, just like the gentleman said there, we don't want the limit set, and right now we have to live with the limits, the same type of limits, that he has. And I think all we ask is that if we feel like we can train people quicker and better, that we be allowed to do that, and from my personal point of view as an owner of my company, I'm interested in having people that are going to be loyal and with our company for a long time and I'd like to get them trained and able to produce and to be a part of what we're trying to accomplish.

I look for people that have a pride in their trade and want to do good work, that want to produce. And I think that's one word that we in the United States have almost—we're getting away from, that we need to produce and we need to work hard, and this is the type of people that we want to have. And we feel like we have a way we can do it better and quicker, and we're not trying to shortchange the apprentice, and we're not trying to shortchange the industry by doing that.

Mr. HAWKINS. Thank you, Mr. Smith. Yes, Mr. Bell?

Mr. BELL. I don't think we have any difference here, really. Andy is saying much the same thing that we've already said in a little bit different way. He used one term, "continuing education" and I think that's something else that we should be thinking about very much, because continuing education is what all people are going to need to keep up to date on whatever job they're in today.

Along those lines, this association, the National Tooling and Machine Association, is engaged in a project right at the moment with Lawrence Livermore Labs, which is one of the largest research labs in the United States, perhaps in the world, and they're engaged in some of the ultimate Buck Rogers technology experiments out there and some of that technology is ready for release to the commercial world, and we're setting up a program whereby some of that technology will be made available to people from our industry to advance their skills beyond a normal journeyman to a higher level, an expert, whatever you might want to call it, by utilizing some of those things that have been learned at the lab.

Competency in time oriented programs, I don't know that we have that big concept here.

Mr. HAWKINS. Well, I thought I had detected a rather strong feeling on the part of some of the earlier witnesses that they were very strongly opposed to the question of time based training, and in connection with that the thing that worries me the most, the thing that seems most confusing is that the training by one employer does not necessarily mean that that training is going to remain forever a relationship between that trainee and that particular company. And there seems to be so much flexibility in the economy at the same time that so much mobility is there, that that individual moves from one job to another, from one region to another, and that if that individual is turned out highly trained for that particular training unit, keeping in mind that that is largely company oriented, that individual may not be trained for a job in some other capacity.

That's one of the things. Perhaps you could comment on that particular phase of it.

Mr. BELL. I'm not sure that I'm following you.

Mr. HAWKINS. Well, there seems to be a suggestion or a Feeling that the individual is being trained to forever remain with one company. Let's say that that company considers the individual competent, so they're getting back to the idea of competency based. It's a judgment of that particular training, that particular firm, where the individual is trained and, let's say, turned out rapidly. That individual is trained.

Another company may not consider that individual trained at all so the individual goes—what happens to the individual? Unless you have some type of a structured program that builds into it the standards or the factors that make that individual, let's say, competent to shift from one company to another, one industry to another, depending on where the jobs are available. That's the factor, it seems to me, that's not always considered, whether or not you're in this issue between competency based, or so-called "competency based programs" and those that are, let's say, build along a particular structured line.

Mr. BELL. Well, structured or coordinated programs will result in a person that is mobile in their skills. They will be able to move from employer to employer. Needless to say, employers, with the economics being what they are, when they train a person they would prefer that they stay with them for the life term. That's not the situation. People do move around.

Good programs will try and train people for the marketplace, for the job place.

I think that's what all four of us are talking about here, really.

Mr. HAWKINS. Thank you. Mr. Erlenborn.

Mr. ERLENBORN. No questions, Mr. Chairman.

Mr. HAWKINS. Mr. Hayes.

Mr. HAYES. Yes; I have a couple of questions I want to raise.

This being the Subcommittee on Employment Opportunities, and this is an oversight hearing on the National Apprenticeship Act, there is a difference, as I interpret it, between the first three gentlemen that presented testimony and Mr. Phillips' testimony. Because I understood Mr. Phillips to say, at least imply, that he had some boot training that was in the industry itself, having been a craftsman at one time or another.

But except what you said, Mr. Phillips, about the minorities in the apprenticeship program, the other three didn't address themselves at all in the area of—no figures to support it, although I haven't gone through verbatim your prepared statement, as to whether or not your programs contained any provision whatsoever for the admission of minorities and women in the program, and no figures to support it.

I just wondered, you seemed to allude to the fact that you could operate better without Federal interference, without unionism, and yet the woman, if you noticed her testimony, Ms. Tierney, before, if you looked at her statement, she mentioned that there are some advantages of women being able to enter into apprenticeship programs through union programs rather than nonunion. I just wanted you to address that. If either one of you want to address yourself to that kind of a problem.

Mr. BELL. In our program, the preemployment program that I referred to, that had brought in over 16,000 people since 1964, into the tooling and machining area, we've had a very, very high content of minorities in that program. The minority content, consistently, has been somewhere around 40 percent.

We have made some very strenuous efforts to recruit females into the program and the highest we've been able to get up to is about 13 percent. The average has been around 6 percent. We have not been able to find an adequate number of qualified female applicants for our particular trade. I think part of it is because of the image that the trade has, tooling and machining trade, that you have to get your fingernails dirty, and I think some of the women just don't gravitate toward that particular trade. That's the only way we can rationalize the lack of applicants.

But we have, as I say, averaged out 6 percent females over the last 10 to 15 years. We've had better than 40 percent minorities over the last 20 years.

Mr. HAYES. Neither one of you gentlemen is saying that the union apprenticeship programs are governmental programs and, then in term, would address itself to whatever illness that might be suffered in a particular industry.

Mr. BELL. Again, I'm not sure of the question.

Mr. HAYES. I don't think either one of you are prepared to say, am I wrong in assuming this, that union apprenticeship programs or Federal programs such as BAT, do you see that as a deterrent to progress of the particular industry, a program that you represent?

Mr. WARNER. I might try to answer that, if I may.

I think there's a little bit of confusion here that probably should be cleared. There's an old saying that, "If it ain't broke, don't fix it." I think that what works for one party might not work for another, or better yet, it would be, in this day and age, as far as apprenticeship training is concerned, it might be nice to have a choice.

What we are proposing is a competency-based program, as you know.

I think the important things to understand, one, to answer your question on minorities, we certainly are encouraging, and the program is designed to accept females and minorities. There's no difference in the intent, the concern, as far as that's concerned.

The second part is that the measure of a person's learning ability, skill, if you will, are in place. There is a means by which you can determine if that individual, once they complete the program, is capable of completing it, whether it be at 3 years or 4 years.

As I mentioned in my testimony, the importance of competency-based programs is the fact that the individual is, to a great extent, allowed to progress at their own speed. Some people learn a lot quicker than others do. What we're trying to do is to place the emphasis on the competency base because we feel that it's going to produce, in the long run, at least for certain facets of our industry, more qualified people, and also greater numbers, including, of course, minorities and females.

I hope that adds something to your concerns.

Did you have something?

Mr. SMITH. Yes, Gary, if I can. I wanted to speak also, to make a statement about the minority and the female. I feel like that in most of our programs it's probably easier to get in our programs than it would be the other programs.

I think we have a real concern in our industry and it's almost time to get on the table and pound up and down, when I said in here that we're going to be missing 2 million workers. That's a lot of people in our industry we're going to need, and what an opportunity for minorities, for women, to come into this area where we do have a shortage. I feel very confident that the contractors are looking for people that are craftsmen, that can train to be craftsmen, that will do a good job for them. That's what they're looking for, to do good work, and we can train them through this type of program that we have set up.

But we welcome and we want minorities and women in our industry.

Mr. HAYES. You recognize the economy has led to a sickness in the old industry itself, particularly in the construction end. The jobs just aren't there in many instances.

Mr. SMITH. Well, fortunately, I'm from Florida and Florida doesn't have that problem right now. [Laughter.]

Mr. HAYES. I'm from Chicago and we have that problem. [Laughter.]

Mr. **Smith**. I realize that. We need people.

Mr. **Hayes**. We'll send them to Florida then. [Laughter.]

Mr. **Erlenborn**. Mr. Jeffords, do you want to ask any questions before we go to answer the bells?

Mr. **Jeffords**. All right. I'll try. I'll try to phrase it in a form that's easy to answer.

I'm a little bit confused as to just what is meant by a competency-based program, and I want to see if I can give you my thoughts. I think, first of all, we have to examine the goals, both from the perspective of the employee, the employer, as well as the unions, and that we have to try and balance those out.

I don't believe you mean, do you, that we should have no time restrictions, that you just come in and take an exam and if you pass it you're in. You don't mean that, do you?

Mr. **Warner**. That's not the intent at all.

Mr. **Jeffords**. OK. But on the other hand, if as I understand what you're saying, that an arbitrary, set length of time, which is longer than may be necessary to determine whether or not the person is going to be reliable and willing to work, but may be too restrictive in the sense that it holds a capable and qualified person back too long from being able to reach his goal of competency. Is that it?

Mr. **Warner**. Uh-huh.

Mr. **Smith**. That's right.

Mr. **Jeffords**. Everybody nodded their head. OK.

Also, I was a little bit confused by some other statements. You do not mean that competency is only employer-specific, but rather, competency means a more general set of competencies which would be transferrable by the employer. I want to make sure that I understand. In other words, there would be general sets of competency standards which should be met so that both the employee and the employer would be assured that that individual knows the trade. There's no disagreement with that?

Mr. **Smith**. That's right.

Mr. **Warner**. Right.

Mr. **Jeffords**. Now, as far as Federal and employer responsibility here, do I understand you to believe that the Federal responsibility and State responsibility is more to prepare somebody in remedial aspects and to have them qualified to learn the specific aspects of the trade and that industry should be more responsible for the specific aspects of training for the industry? Is that a generalization that's correct?

I guess, Gary, what I'm thinking of is two things. One was the comment about remedial training being difficult. Second, was a comment in your testimony that we should make vocational education more related to available jobs.

Mr. **Warner**. Well, I guess I'll try to answer your question. In many instances, in certain regions of the country, we think that there are some deficiencies in the vocation education system as it relates to the larger scope of the construction industry. I think the relationship that is being established between the contracting associations and the national association on the vocational side is the first step in trying to resolve that problem.

But we do feel and have some concern that the students that are coming out of the vocational education system today, again, in certain regions of the country, do not have the basic understanding or skills to enter the construction industry on the large scale. They may be fine, for example, going into homebuilding, that area, but in working for a medium- or large-sized general contractor, it is a problem. So that, I think, is the point we're trying to make in that regard.

Mr. Jeffords. Well, thank you. I'm sorry, we have to go. We have a choice now of getting the Greeks or the Turks mad at us. And if we don't get there soon we'll have them both mad at us. [Laughter.]

Mr. Jeffords. That's the choice at hand.

Mr. Erlenborn. This panel will be excused and the committee will be recessed for about 15 minutes. Thank you. There's coffee in the basement, if you want it. Be back in 15 minutes, please.

[Brief recess.]

Mr. Hawkins. The committee will come to order. The next scheduled witness is Mr. Robert Georgine of the Building Trades Department. I understand that Mr. Georgine is not here. We will keep the record open, however, for the statement which I am sure he will submit in the event that he does not appear this afternoon.

The next——

Mr. Erlenborn. Mr. Chairman.

Mr. Hawkins. Mr. Erlenborn.

Mr. Erlenborn. There are several letters from other interested parties that we have and I would appreciate it if the record would be held open so that we could have those entered into the record.

Mr. Hawkins. Without objection, the record will be held open.

[The letters from interested parties mentioned by Mr. Erlenborn follow.]

[Material referred to appears at end of hearing.]

Mr. Hawkins. The next witnesses on the panel, Mr. Raymond Robertson, the Joint Apprenticeship Committee, AFL-CIO, and he is accompanied by Mr. Kenneth Edwards, International Brotherhood of Electrical Workers, Mr. Tom Gustine, Painters & Allied Trades, Mr. Merlin Taylor, Bricklayers & Allied Craftsmen, Mr. Reese Hammond of the Operating Engineers. Would those witnesses please be seated? We're delighted to welcome you and I assume that Mr. Robertson will be the anchorperson.

Mr. Robertson. Yes.

Mr. Hawkins. Thank you.

[The prepared statement of Raymond Robertson follows:]

### PREPARED STATEMENT OF RAYMOND ROBERTSON, CHAIRMAN OF THE JOINT APPRENTICESHIP COMMITTEE OF THE BUILDING AND CONSTRUCTION TRADES DEPARTMENT AND THE METAL TRADES DEPARTMENT, AFL-CIO

Mr. Chairman, I would first of all like to thank you for scheduling hearings on apprenticeship and also thank you for the opportunity to speak before the Committee today.

My name is Raymond Robertson and I am Chairman of the Building Trades—Metal Trades Joint Apprenticeship Committee which has representatives from 22 international unions representing more than 5 million members and approximately 230,000 registered apprentices. Also on the committee are representatives from three departments of AFL-CIO: the Department of Civil Rights, the Department of Education and the Human Resource Development Institute. I am also Executive Director of Apprenticeship and Training for the International Association of Bridge, Structural and Ornamental Iron Workers, AFL-CIO.

My testimony will concentrate primarily on apprenticeship in the building trades. The testimony of Mr. Paul Burnsky, President of the Metal Trades Department, will cover apprenticeship in the metal trades affiliates.

In a previous letter to the Committee concerning these hearings, Building and Construction Trades Department President Robert A. Georgine pointed several concerns which we in the building trades have with the federal government's role in apprenticeship.

Today, however, I would like to focus on the strong record of apprenticeship in the United States and in particular the success in the construction industry.

While apprenticeship isn't the answer to all of cour country's training needs, it remains the best method of training skilled workers in the building trades.

## WHY APPRENTICESHIP?

Apprenticeship, because it combines on-the-job training in manual skills with theoretical underpinnings in the classroom, produces well-rounded, skilled, productive workers who are the hallmark of quality in the building trades.

The achievement of quality craftsmanship isn't a quick process, nor is it easy. But quality has never been quick or easy to achieve.

Quality construction is built on the foundation of a thorough knowledge of the craft by the workers in the industry. Because apprentices are instilled with that broad-based knowledge and commitment to the craft, they develop a strong sense of pride in their work. A construction worker's career wills span many years, requiring him to adapt through his individual abilities to continuous technological change in the craft. Other industries, by contrast, break work operations down into specialized tasks, and many suffer accordingly in the skill capabilities of the worker.

The tragedy to the worker of this over-specialization can be seen on the assembly line. Work operations were broken down into minute, repetitious tasks which often caused workers to lose a sense of identity with their work and pride in their accomplishment. The result is a loss in worker skill levels at the expense of a temporary gain in speed.

Many corporate leaders now recognize the long-term detriment of over-specialization and are taking steps to change it. Quality of worklife circles, popularized in other countris, are again being used in American industry. These circles, which give workers more input in their work environment, also add to the sense of pride and accomplishment in their work.

U.S. manufacturers are also increasingly looking at examples in foreign countries, where teams of workers produce entire assemblies rather than each worker putting on specific bolts or parts on an assembly line. Because these teams of workers have a thorough knowledge of their craft, they produce a higher quality product. They are faster, more efficient and happier in their jobs.

The skill required for quality craftsmanship requires patience, commitment and hard work.

It is skilled workers with commitment to excellence which we must have and continually strive to develop through our apprenticeship programs in the building trades. But it is not just the worker who benefits from his skill and dedication to excellence. Apprenticeship, and the high quality workmanship that results from it, are also advantageous for the employer. Concerned employers play a major role in every phase of building trades apprenticeship programs, and for good reasons.

As former Secretary of Labor Ray Marshall showed conclusively in his 1973 study, workers who trained through apprenticeship programs are more productive and more employable.

Journeymen who have completed apprenticeship programs thus pay rich dividends to their employers because of their well-rounded training. The construction industry rewards more productive workers and high quality workmanship by giving steady employment to those workers.

Secretary Marshall found that in 84 percent of the cases apprenticeship-trained workers enjoy more steady employment than other journeymen.

Secretary Marshall also demonstrated that journeymen who have come up through apprenticeship programs move more quickly into supervisory positions than other journeymen—as much as 4-5 years faster in electrical work, iron work and sheet metal work.

Marshall is not alone in these findings. Robert Glover, who testified before this Committee, former Secretary of Labor John Dunlop and Quinn Mills, nationally known construction industry economist among others have produced similar results when studying the construction industry.

Most recently, Dr. Steven Allen of North Carolina State University reported that union construction workers are more productive than non-union workers, because of superior training. "Many construction workers go through four-year (union) apprenticeships," stated Allen. They have very thorough and varied knowledge and require less training on the job and less supervison.

In short, apprenticeship programs produce the kind of workers we should be training in order to maintain high quality construction and our commitment to excellence.

It is also important to note, that while we in the building trades have only begun to be threatened by foreign competition which plagues other American industries, we must continue our commitment to excellence if we are to compete effectively with foreign construction.

Foreign countries take advantage of their lower standards of living and lower wage rates to undermine our construction industry just as they have done in so many other areas. Our best defense against such competition is high quality work based on the strong foundation of apprenticeship.

## THE STATUS OF APPRENTICESHIP IN THE BUILDING TRADES

The building trades' historical commitment to apprenticeship is clear by our continuing high number of apprentices in joint programs. For the last 30 years, between 50-65 percent of all apprentices in the United States have been in the building trades. In 1979, the most recent year for which statistics are available, 58 percent of all registered apprentices were in the building trades.

Apprenticeship programs in the building trades are also unique in their attachment to sponsorship by Joint Apprenticeship Committees (JACs). Through joint sponsorship, unions share full practical and legal responsibility for the operation of apprenticeship programs with our management counterparts. In the contruction industry as of 1979 86 percent of apprentices—more than 150,00—were enrolled in joint programs. This compares with only 48 percent of total apprentices in joint programs in the nonconstruction industries. Thus, our commitment to apprenticeship is also a commitment to joint control with management. This is a healthy sign of the needed labor-management cooperation so often talked about today.

Although the Labor Department ceased keeping track of the number of apprentices in 1979, we can say without hesitation that there are fewer apprentices enrolled today than four years ago. The blame for this can be squarely placed on the sad plight of our national economy, which has kept the construction industry in a depression for much of the last three years.

Unemployment in the construction industry hovers in the 20-25 percent range, more than twice that of the overall rate in the economy.

Our apprenticeship programs have sufffered accordingly. Without jobs, there can be no on-the-job training for apprentices. If we can't keep our members working, are fewer jobs for our apprentices—the same apprentices whose skills will be in high demand to bring us out of the recession and lead our economy to a strong recovery.

In short, the single most deterimental factor for apprenticeship in this country is the continued blight of unemployment caused by recession. Even now, hope for recovery in the construction industry continues to suffer under the threat of continued high interest rates due to the federal budget deficit.

Historically committed to apprenticeship, the building trades are, at the same time, flexible to adapt to changing times. Recruitment and admission, curricula and teaching methods have been modernized and updated to meet the challenge of recent years.

The problem of minority under-utilization, which confronted the construction industry along with the rest of the society in the 1960s, was taken head-on by the building trades. As a result of apprenticeship information centers, outreach programs, various types of pre-apprenticeship, trainee programs and on-the-job training, minorities have made significant gains in construction apprenticeship since 1960. The record of minority participation in the building trades compare more than favorably with the workforce in general and educational institutions. Minorities comprised only 2.2 percent of contruction apprentices in 1960. The total jumped to 7.2 percent by the end of 1968, 15.1 percent by the end of 1972 and more than 18 percent by the end of 1979. This is a record of progress of which we are proud.

The lack of women in apprenticeship is a separate problem, however, not unique to the building trades. Along with the rest of the society, the building trades began to be confronted with the need to increase the participation of women during the

1970s. Extensive efforts have been made to meet that goal. By 1978, women were 1.9 percent of all newly-indentured construction apprentices, with some crafts considerably higher than that. For example, 4.2 percent of apprentices in the operating engineers' programs and 5.1 percent of painters apprentices were women.

Progress is being made, but there is a long way to go. The problem of participation of women in building trades apprenticeship programs, however, is fundamentally different than that of minority participation.

Even with all institutional barriers to enter into building trades apprenticeship programs eliminated, there can still exist a physical barrier to entry for women. Bringing women into apprenticeship programs—and more importantly, keeping them there—requires more than just encouraging participation. Society as a whole must begin to change the entire socialization process that our children go through if society is to significantly strengthen the representation of women in non-traditional occupations.

The building trades joint apprenticeship programs have always responded to the needs of target groups in the society. All building trades programs have a strong record in admitting returning veterans to apprenticeship programs, giving that target group a head start on readjustment in the civilian workforce.

We in the building trades have made and continue to make strong efforts to achieve greater representation of women in apprenticeship programs. But we must also recognize that the achievement of this goal must be the responsibility of the entire society.

Building trades apprenticeship programs are also changing rapidly with the changing methods of instruction and demands of the apprentices. In many joint apprenticeship programs, such as the electricians, operating engineers and sheet metal workers, there is now an opportunity for apprentices to enroll in dual programs and have their apprenticeship classroom instruction accepted as accredited coursework toward community college degrees. In this way, skilled craftworkers can round out their education for their personal fulfillment.

Many young students cannot afford either the expense of going to college today, nor the four years of lost income which they must forego. Because apprentices earn money through their on-the-job training, they are in an ideal position to learn a craft and simultaneously use their apprenticeship background to pursue continuing education.

Apprenticeship programs in the building trades today also take advantage of the most modern teaching techniques in order to provide up-to-date instruction both for apprentices and journeymen. In order to adapt to rapdily changing technology, all crafts have developed journeymen re-training programs to help workers keep their skills up-to-date. Advanced instructional techniques such as videodiscs, synchronized slide and tape shows, and traveling instruction vans provide today's apprentices with the necessary training to keep up with technological advances in the construction industry.

Several joint apprenticeship programs have also taken steps toward performance-based, rather than time-based modes of training. In two building trades programs, the entire system has been switched to peformance-based training, which stresses individualized instruction with a heavy emphasis on manipulative training.

Other crafts have reduced the term of apprenticeship from five to four years through the introduction of competency testing and other new teaching methods.

Programs have also been revised and updated to meet the challenges of advancing technology in the construction industry. The space industry, nuclear energy, energy conservation, electronics, and other areas of increasing technological advancement all add to the body of knowledge with which apprentices must be familiar. In some cases, this has required apprenticeship programs to expand rather than cut back the term of apprenticeship.

## THE FEDERAL ROLE IN APPRENTICESHIP

More than 40 years ago, the Congress mandated the role of the federal government in apprenticeship for three primary purposes: a) to protect the welfare of the apprentice; b) to promote the system of apprenticeship; and c) to encourage management and labor to jointly develop standards for the industry. Those three purposes are as necessary and proper for the federal government now as they were in 1937 when the Fitzgerald Act was passed.

The Fitzgerald Act was written largely in response to the deplorable conditions of apprentices which then existed in some areas. At its best, apprenticeship has been an important means to convey skills from one generation to another. But at its worst, through their indenture, apprentices were vulnerable to exploitation of one form or another in the workplace, including inadequate training, low wages and terms of training beyond what was needed for learning. These conditions can be repeated in cases where apprentices have no representation in apprenticeship programs.

Today's apprentice needs the same protection of the federal government as was necessary in 1937. While the exploitive practices prevalent in the early part of the century may be a thing of the past, new practices are equally detrimental to apprentices. Moves are currently afoot to break down the apprenticeable trades into fragmented parts. These efforts provide workers with such narrow training skills as to leave them at the mercy of unscrupulous employers and the marketplace. Where a craftworker is presently employable beyond the life of a construction project, the new so-called apprentice—who is taught only a narrowly defined skill—will be employable for only the short time it takes to complete this finite task. This individual, who has been promised a future by learning a craft, will be forced to spend more time looking for work than actually on the job. Though this isn't the same as the exploitation which took place prior to 1937, it is just as harmful and the federal government has a similar responsibility to prevent it.

The building trades, by necessity, play a significant part in building the military bases, plants and air bases necessary for a strong national defense. Brilliant examples of construction workers coming to the aid of their country can be found throughout modern history—in World War II, Korea and Vietnam most expecially. In the event of a national emergency or national disaster, it is too late to begin training the skilled workforce that will be pressed into action in the wide variety of jobs that depend on peace-time apprenticeship programs. The federal government must maintain a constant commitment to its skilled construction workforce in order to insure our continued emergency preparedness and a strong national defense.

Although we hear again and again today about the need for investment in plants and equipment to rebuild our industrial base, there can be no wiser investment in our nation than the investment in people. Our country spends a great deal of money and energy investing in our natural resources. Equally important is the investment in our human resources. America's greatness has come not as a result of our machines, but through the hard work and ingenuity of our people.

Apprenticeship is certainly one of the most cost-effective investments that the federal government can make. Unlike many other programs, apprenticeship is nearly entirely privately financed. Union workers and employers recognize the need for high-quality training in order to preserve the construction industry. As part of their collective bargaining agreements, union workers support apprenticeship programs in lieu of higher wages. Whereas the construction industry (unions and employers) spent more than $230 million to provide apprenticeship training last year, the federal government, through the Bureau of Apprenticeship and Training spent less than $15 million. That cost, which provides oversight, guidance and prevents abuse of the system, is precious little to pay for the long-lasting benefits of a highly skilled workforce.

Another important role for the federal government is to set the standards for apprenticeship throughout the country. The construction industry is increasingly regional and national in character. Large construction companies operate in several states at once and move their workforce with them as they go. Many existing state apprenticeship councils function well with both labor and management. But, if apprentices were governed by different sets of standards in each state, it would make full employment virtually impossible for apprentices and could cripple the construction companies themselves.

The enforcement of equal opportunity laws also presents itself as a proper area for federal involvement. In no other area of education has the federal government seen fit to leave the fulfillment of equal opportunity up to the states. Apprenticeship is no place to start.

Finally, there is a legitimate role for the federal government to play in stimulating apprenticeship during extended periods of recession. As stated earlier, the present recession has been the worst enemy of building trades apprenticeship programs. If the federal government were to counter the recession by promoting construction projects which could provide jobs for workers and training positions for apprentices, it would simultaneously boost the economy and help to train the skilled workforce which will be necessary once the recession is over.

The apprenticeship system is one of the finest examples of successful management-labor cooperation in modern society. In the building trades, employers work with unions to train workers recognizing both the advantage to their firm and for the good of the industry. It is a system which works well and has shown adaptability and a capacity to innovate.

Our joint apprenticeship system deserves more continued support of the federal government, not less. It merits a strengthened and renewed commitment by the Congress to its principles.

### *Affiliates of the Joint Apprenticeship Committee*

International Association of Heat and Frost Insulators and Asbestos Workers.
International Brotherhood of Boilermakers, Iron Shipbuilders, Blacksmiths, Forgers and Helpers.
International Union of Bricklayers and Allied Craftsmen.
United Brotherhood of Carpenters and Joiners of America.
International Brotherhood of Electrical Workers.
International Union of Operating Engineers.
International Association of Bridge, Structural and Ornamental Iron Workers.
Laborers' International Union of North America.
Tile, Marble, Terrazzo, Finishers, Shopworkers and Granite Cutters International Union.
International Brotherhood of Painters and Allied Trades.
Operative Plasterers' and Cement Masons' International Association.
United Union of Roofers, Waterproofers and Allied Workers.
Sheet Metal Workers' International Association.
United Association of Journeymen and Apprentices of the Plumbling and Pipe Fitting Industry.
International Association of Machinists and Aerospace Workers.
International Brotherhood of Firemen and Oilers.
Molders and Allied Workers Union.
Office and Professional Employees International Union.
Service Employees International Union.
International Federation of Professional and Technical Engineers.
Upholsterers' International Union of North America.
Department of Civil Rights, AFL-CIO.
Department of Education, AFL-CIO.
Human Resources Development Institute, AFL-CIO.

## STATEMENT OF RAYMOND ROBERTSON, JOINT APPRENTICESHIP COMMITTEE, AFL-CIO, ACCOMPANIED BY KENNETH EDWARDS, INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS; TOM GUSTINE, PAINTS & ALLIED TRADES; MERLIN TAYLOR, BRICKLAYERS & ALLIED CRAFTSMEN; AND REECE HAMMOND, OPERATING ENGINEERS, A PANEL

Mr. ROBERTSON. Good morning, Mr. Chairman.

At the outset, I would like to thank you for scheduling these oversight hearings and inviting me to testify on the important issue of apprenticeship. My name is Raymond Robertson. I am chairman of the Building Trades-Metal Trades Joint Apprenticeship Committee which has representatives from 21 international unions representing over 5 million members and approximately 230,000 registered apprentices.

Also represented on the committee are representatives from three departments of the AFL-CIO, the department of civil rights, the department of education, and the human resources development institute. I am also executive director of apprenticeship and training for the International Association of Bridge, Structural, and Ornamental Iron Workers, AFL-CIO.

My testimony will concentrate primarily on apprenticeship in the building trades. The testimony of Mr. Paul Burnsky, president of the metal trades department of the AFL-CIO, will primarily cover apprenticeship in the metal trades affiliates.

With me here today are fellow members of the joint apprenticeship committee, Kenneth Edwards, director of skill improvement training, International Brotherhood of Electrical Workers; Reece

Hammond, director of apprenticeship and training, International Union of Operating Engineers; Merlin Taylor, director of apprenticeship and training, International Union of Bricklayers & Allied Craftsmen; and Thomas Gustine, director of education, apprenticeship, and training, International Brotherhood of Painters & Allied Trades.

I have submitted a statement for the record which I will briefly summarize in my remarks today.

In a previous letter to the committee, the building and construction trades department president, Robert Georgine, pointed out several concerns which we in the building trades have with the Federal Government's role in apprenticeship. Today, however, I would like to focus on the strong record of apprenticeship, especially in the building trades.

Apprenticeship, because it combines on-the-job training and manual skills with the theoretical underpinnings in the classroom, produces well-rounded, productive workers, who are the hallmark of quality in the building trades. Quality construction is built on the foundation of a thorough knowledge of the craft by the workers in the industry. Because apprentices are instilled with that broad-based knowledge and commitment to the craft, they develop a strong sense of pride in their work which will span many years and must, in that time, adapt to individual abilities, to continuous technological change in a craft.

Other industries, by contrast, break work operations down into specialized tasks and many suffer accordingly in the skilled capability of the worker. It is not just the worker who benefits from his or her skill and dedication to excellence. Apprenticeship and the high-quality workmanship that results from it are also advantageous for the employer.

Concerned employers play a major role in every phase of building trades apprenticeship programs, and for good reasons. Former Secretary of Labor Ray Marshall showed conclusively in his 1973 study that workers who have been through apprenticeship programs are more productive and more employable. Secretary Marshall found that in 84 percent of the cases studied, apprentice-trained workers enjoyed more steady employment than other journeymen.

Marshall was not alone in these findings. Robert Glover, who has testified before this committee, John Dunlop, former Secretary of Labor, and Quinn Mills, nationally prominent construction industry economist, and others, have produced similar results when studying the construction industry.

More recently, Dr. Steven Allen of North Carolina State University reported in August of this year that union construction workers are more productive than nonunion workers because of superior training, also because many construction workers go through multiyear apprenticeship. They have very thorough and varied knowledge and require less training on the job and less supervision.

In short, apprenticeship programs produce the kind of workers we should be training in order to maintain high-quality construction and our commitment to excellence.

The building trades' historical commitment to apprenticeship is clear by our continuing high number of apprentices and joint programs. For the last 30 years between 50 to 65 percent of all apprentices in the United States have been in the building trades. In 1979, the most recent year for which statistics are available, 58 percent of all registered apprentices were in the building trades.

The building trades also have a strong commitment to joint programs, programs jointly sponsored where unions and management share both practical and legal responsibility for the operation of the program. Nearly 90 percent of apprentices in the construction industry are in joint programs, and this is a healthy sign of the needed labor-management cooperation so often talked about today.

The building trades are, at the same time, flexible to adapt to changing times. Recruitment and admission, curricula, and teaching methods have been modernized and updated to meet the challenge of recent years. The problem of minority underutilization which confronted the construction industry, along with the rest of society, in the 1960's, was taken head on by the building trades. Whereas minorities comprised only 2.2 percent of construction apprentices in 1960, the total jumped to more than 18 percent by the end of 1979. This is a record of progress of which we are proud.

The building trades joint apprenticeship programs have always responded to the needs of target groups in society. All building trades programs have a strong record in admitting returning veterans to apprenticeship programs. We have also made significant strides in bringing women into nontraditional occupations. While we recognize that there is always room for improvement, we are doing all we can to break down the institutional barriers to entry for designated target groups.

It should be noted that apprenticeship programs in the building trades today take advantage of the most modern teaching techniques in order to provide up-to-date instruction, both for apprentices and journeymen. In order to adapt to rapidly changing technology, crafts have developed journeyman upgrading programs to help workers keep their skills up to date.

It should also be pointed out that the building trades, by necessity, play a significant part in building the military bases, plants, and airbases necessary for a strong national defense. Brilliant examples of construction workers coming to the aid of their country can be found throughout modern history, in World War II, Korea, and Vietnam most especially.

In the event of a national emergency or a national disaster it is too late to begin training the skilled work force that will be pressed into action in a wide variety of jobs that in the time of war become dependent upon skills learned in a time of peace.

The Federal Government must maintain a constant commitment to its skilled construction work force in order to insure our continued emergency preparedness and a strong national defense.

I would also like to point out that apprenticeship is certainly one of the most cost-effective investments that the Federal Government can make. Unlike many other programs, apprenticeship is nearly entirely privately financed. Union workers and employers recognize the need for high-quality training in order to preserve the construction industry. As part of their collective-bargaining agreements, union workers support apprenticeship programs in lieu of higher wages.

Whereas the construction industry, unions, and their employer counterparts spent more than $230 million to provide apprenticeship training last year, the Federal Government, through the Bureau of Apprenticeship and Training, spent less than $15 million. That cost which provided oversight and guidance and was a barrier to abuse, is precious little to pay for the long-lasting benefits of highly skilled workers, a highly skilled work force.

In closing, I would like to say that more than 40 years ago the Congress asserted the role of the Federal Government in apprenticeship for three primary purposes: One, to protect the welfare of the apprentice; two, to promote the system of apprenticeship; and three, to encourage management and labor to jointly develop standards for the industry.

Those three purposes are as necessary and proper for the Federal Government now as they were in 1937 when the Fitzgerald Act was passed.

Specifically, let me outline what we believe are necessary roles for the Federal Government and apprenticeship. One, it is necessary for the Federal Government to protect the apprentice from fragmentation of the trades, which leaves workers with such narrow training as to leave them at the mercy of unscrupulous employers and to the marketplace.

Two, the Federal Government must maintain a constant commitment to its skilled construction work force in order to insure our continued emergency preparedness and a strong national defense.

Three, the Federal Government must set the standards for apprenticeship throughout the country. Because of the increasingly regional and national character of the construction industry, if an apprentice were governed by different sets of standards in each State, it would make full employment virtually impossible for apprentices and could cripple the construction companies themselves.

And four, and finally, there is a legitimate role for the Federal Government to play in stimulating apprenticeship during extended periods of recession.

The apprenticeship system is one of the finest examples of successful management/labor cooperation in modern history. It deserves more continuous support of the Federal Government, not less. It merits a strengthened and renewed commitment by the Congress to its principles. And that concludes my summary of the statement submitted earlier, and the panel members and myself are prepared to answer any questions that you might have.

Mr. HAWKINS. Thank you, Mr. Robertson.

May I, first of all, ask one of the questions directed at one of the earlier witnesses concerning the high dropout rate for minority apprentices? Assuming that our figures are correct, it would seem that minorities had a dropout rate 1.5 times as often as their record of completions as compared with an overall rate of whites who completed the program, apparently 2 times as often as they dropped out. Assuming that that is correct, have you any reason or explanation for why that could happen?

Mr. HAMMOND. I'm not familiar with those statistics, Mr. Congressman, but I must say that if they cover the period of time in the seventies, if I multiply properly, what you're saying is that there was a 60-percent dropout rate for minorities. In other words, if 100 complete and 150 don't complete, that's 60 percent didn't make it.

And conversely, I believe earlier you said that there was only a 33-percent dropout rate of whites.

Mr. HAWKINS. That's roughly correct.

Mr. HAMMOND. Yes.

Mr. HAWKINS. I don't know my mathematics quite as well as you do. But that comes near it.

Mr. HAMMOND. Then you're in trouble.

Mr. HAWKINS. What is your experience? Let's not rely on that.

Mr. HAMMOND. I have not found that's true in our trade.

Mr. HAWKINS. In the current situation there's the current dropout rate among minority apprentices. Is it substantially higher than that of other groups, in your experience?

Mr. HAMMOND. I would say, in all honesty, I would say in our trade there was a period of time in the late sixties and the early seventies, before Outreach programs got into place, and began to function, that we did not get the kind of screening that was necessary to give us what we like to call "the best bets" for successfully completing apprenticeship.

When we got the assistance of Outreach programs such as the Urban League and the recruitment and training program, some of the womens groups, PREP was mentioned earlier by one of the witnesses, the level of success, if you would have it, became higher because the screening going in was better. Somebody indicated that apprenticeship is a free opportunity to learn. And a lot of people want to get in on that and that's certainly understandable. But specifically in response to that question, I would say that if that were the case 4 or 5 years ago, it's probably much less the case now, and for the reasons I explained the better job you do in terms of picking potential successes, the better luck you should have.

Mr. ROBERTSON. Mr. Merlin Taylor would like to comment.

Mr. HAWKINS. Mr. Taylor.

Mr. TAYLOR. Yes; Mr. Chairman, those figures are all-inclusive. Those are the union and nonunion apprentices totally. Is that correct?

Mr. HAWKINS. Yes, I think it is. My understanding is according to the GAO study that was among unions——

Mr. TAYLOR. Just union programs?

Mr. HAWKINS. Yes.

Mr. TAYLOR. Well, I could only respond for the Bricklayers and Allied Craftsmen, and within our organization that kind of disparity is certainly not evident. We've had extensive experience in preapprenticeship through MBTA since 1960. I mean 1970 through 1979. And we have some very detailed figures on the experience of minority and women candidates who came through our programs.

As I said, I could only respond on behalf of our organization and perhaps we might have an opportunity to look at those figures and further define them for you and get back later with them.

Mr. HAWKINS. Mr. Robertson, you had indicated in your prepared statement that 50 to 65 percent of all apprenticeships have been in the building trades. Does that include registered apprentices or all apprentices as well?

Mr. ROBERTSON. That's registered, I assume.

Mr. TAYLOR. Registered apprentices.

Mr. HAWKINS. It would seem the building trades has had more than a proportionate share of that. Why is it that the other apprenticeable occupations have been so underrepresented as compared with the building trades? Any particular reason?

Mr. ROBERTSON. I don't think they have developed the types of programs that we in the building trades have developed and the standards and so forth have a lot to do with it. By us working jointly with management I think we're able to have more, you know, employ more apprentices and so forth and to start more apprentices, and to keep them employed.

Ken.

Mr. EDWARDS. Mr. Chairman.

Mr. HAWKINS. Yes.

Mr. EDWARDS. I would say that on the average most of the construction industry employers are quite small and they, themselves, could not train sufficiently by themselves, so they have collectively come together to train people and just have promoted more apprenticeship than you would find in the other ones.

The other thing that would influence this a great deal is the contractors being allowed to use apprentices on Federal jobs under Davis-Bacon which has influenced the use of apprentices more. It was a carrot more than it was anything else.

Mr. HAWKINS. It would seem to me that that alone would skew the situation of women rather badly because historically women have not been highly represented in the building trades, and some of the occupations in which they have been much more represented, apparently, there aren't many apprenticeship programs, and if the—if the status of women, if we consider that in the building trades, with its great number of apprenticeship programs, would be expected to share a much larger share of the burden, it would seem to me, than any other industry.

In terms of the issue that was raised this morning concerning the time-based version of the competency factor in programs. I think you were present, most of you were present, this morning, and the argument seemed to be used that, because of this time factor—that is, a 4-year apprenticeship program, for example, or a specified number of years, 3 or 4 or 5, is unusually long and that that discourages the entrance of minorities, women, and disadvantaged groups into industry.

Would you care to comment on that, Mr. Robertson?

Mr. ROBERTSON. Actually there is no proof of the fact that that would prevent minorities and women and so forth coming into the building trades.

I would like Reece Hammond to answer that and also Tom Gustine on the particular question. Is that all right, Mr. Chairman?

Mr. HAWKINS. Yes, sure. Anyone. Mr. Gustine, is it?

Mr. GUSTINE. Yes. On the performance-based training, I found it rather interesting today that it seemed to come as a revelation to a lot of people, as something new on the scene. It is, in fact, I think, as old as apprenticeship itself, and is really a term that can be applied directly to apprenticeship.

Performance-based training is a part of the training system. To have a truly complete training system you also must couple that with the testing procedure, a testing procedure that objectively determines competence. Also you need a—you have to guarantee the apprentice that he's going to get broad-based training, broad-based in the sense that it's going to provide him with a true career opportunity, in whatever industry he goes into, whatever career he picks, whether it's the construction industry or some industrial career.

Without some time setting, it seems to me that you have no finite situation. Who is going to determine competency levels? Who is going to determine when a person is truly competent, when he has truly achieved broad-based training and can function within a given industry? Some of the comments I heard this morning and the description I heard for performance-based training would lend itself very well to narrow political training, very poorly to broad-based career training for any individual. And I think that's the one thing that perhaps is the most important about apprenticeship today or the role of those of us that guide apprenticeship, is to protect the individual in this whole system, to see that he is able to achieve his full potential in the system and from the system.

Mr. HAWKINS. Well, to what extent is the training specialized? Let's assume it's in the building trades. Would an apprentice who is, let's say, trained in an apprenticeship program for the bricklayers be able to go into any of the other parts of the building trades industry or is the training specifically geared to just one craft without any possibility of adaptability to some other craft?

Mr. GUSTINE. Well, I can't speak for the bricklayers, but my experience with painters has been that there is a broad spectrum of career opportunities within the painting trades. After one has learned a broad-based—has a broad-based knowledge of the craft, there is a tendency, perhaps, to move toward a specialty that he is particularly interested in and that he enjoys doing. But he has the capacity and the ability and the knowledge to work where the work opportunities are.

Those skills, some of those skills, would certainly be applicable in other crafts, but not primarily.

Mr. HAWKINS. I assume that's generally the opinion of the other witnesses?

Mr. EDWARDS. Yes.

Mr. TAYLOR. Yes.

Mr. HAMMOND. Mr. Chairman, I'd like to point out that competency-based training is no more a buzzword than apprenticeship is a buzzword. In order to determine competencies in any kind of scientific and objective manner, job analysis has to be done. And one of the first things you do in a job analysis is to agree that you're going to use words accurately and with a common meaning, and I think one of the problems in this room today is that there is no common understanding of the term of "competency-based training."

I submit, as was mentioned by one of the AGC testifiers here, I might point out the open shop AGC, that our union has gone into the field of competency-based training. As a matter of fact, we've spent over $2 million in the last 6 or 7 years to determine what those competencies are and how to reach them, and I can submit to you, and I'd be interested in discussing this with the representative, the testifier, from the National Tool and Diemakers Association, that there is no evidence that will stand up that the average individual can achieve the same level of skill and the same number of skills any faster or significantly faster under competency, so-called competency-based training than a realistic time-based training.

In fact, competency-based training can quite often lengthen the required time to finish a program because if the competencies haven't been learned you'd have to stick around until you do learn them. And I might further point out, sir, that the ultimate performance test in competency-based training is supposed to lead to successful performance. The ultimate performance test is being able to hold a job and the really ultimate, ultimate performance test is to be able to hold a job in your chosen occupation for your life, and I'm not at all sure that we are using the term "competency-based training" in the same fashion in this room.

Mr. HAWKINS. Mr. Erlenborn.

Mr. ERLENBORN. Thank you, Mr. Chairman.

In the interest of time I'm not going to ask very many questions. This hearing has gone on quite a long time. We're probably all thinking about lunch. But let me ask first, would you or any of you recommend that we have a joint group, a committee, let's say, of labor, management, education, and Government to review the apprenticeship standards and related curriculum, to insure that we're using the best techniques to train our Nation's craftsmen?

Mr. ROBERTSON. I'd say that this would be a good way of looking at it and get everybody together jointly. That's what we do on our apprenticeship programs now in the building trades. We work together jointly and I think that could be a very good move.

I don't know. Do all of the panel members agree with that?

Mr. EDWARDS. Yes.

Mr. ROBERTSON. OK.

Mr. TAYLOR. I think it would be a very great step forward, particularly now when apprenticeship is so beleaguered.

Mr. ERLENBORN. That leads me to my next question. You say apprenticeship is beleaguered. I presume you're thinking of the Department of Labor and the lack of emphasis there on apprenticeship. I note that none of you has really commented on that so far, so let me invite you to do so. What do you think we should be doing over at the Department of Labor, with the Bureau of Apprenticeship and Training, and what other kinds of support should the Federal Government, through the Department of Labor or otherwise, be providing so that we can be certain that apprenticeship is working well and providing the craftsmen that we need?

Mr. GUSTINE. I welcome the opportunity to comment, with the permission of the chairman.

Mr. HAWKINS. Yes.

Mr. GUSTINE. I think that the presenters on Tuesday, Mr. Grabowski and the Commissioner of Labor for North Carolina, and Dr. Glover made specific recommendations. I would not be able to say that I agree in detail and in analysis in every facet. However, I think some very substantive recommendations were made at that time. Personally I feel that the present administration of the apprenticeship, national apprenticeship system, through the Bureau of Apprenticeship and Training, is woefully lacking. The field staff, everyone that I've talked to within the last 2 years, at least, these people are just completely demoralized, mainly because they are not able to carry out their task, their mandate, and for very good and valid reasons, cutbacks, RIF's, travel budgets taken away. They cannot service their accounts. And this is a waste. It's a waste of good taxpayers' money for the number of people who are still in place.

I think that there is a role for the Bureau of Apprenticeship and Training to play under the new Job Training and Partnership Act, because many of the area contracts, many of the PIC's will be approving contracts and subcontracts, which will train in the apprenticeable areas, building trades, and nonbuilding trades. I think, further, that there has to be a resolution in the overlapping responsibilities that you've heard so much about between the Federal-State relationship, and I think some of the recommendations that were made deserve some very keen consideration.

Mr. ERLENBORN. I presume the rest of you are in agreement?

Mr. ROBERTSON. Anyone else? Ken, do you want to say anything?

Mr. ERLENBORN. I think it was suggested on Tuesday by one of the witnesses that we need to redraft the underlying legislation, the Fitzgerald Act, that legislative changes as well as just change in emphasis or commitment would also be needed. I might suggest to the chairman that Mr. Fitzgerald is probably unknown to all of us, though he has become immortal by having his name attached to the act.

If we were to redraft it, we could call it the Hawkins-Erlenborn-Hayes Act. [Laughter.]

Mr. HAWKINS. It seems to me it's identified with a liquor of some kind too, isn't it?

[Laughter.]

Mr. ERLENBORN. Isn't that Old Fitzgerald?

Mr. HAWKINS. Old Fitzgerald? [Laughter.]

Mr. ROYALS. Old Hawkins. [Laughter.]

Mr. ERLENBORN. What do you feel about that, or how do you feel about the need for any legislative changes?

Mr. EDWARDS. First of all, I don't think we need any legislation to change. What we need is enforcement of what was written in the Fitzgerald Act. It's only three paragraphs long but the substance is in one paragraph, and if we can't get the Federal Government to enforce what's written in that one paragraph, then why have a new act with 30 to 40 to 120 pages, sir?

Mr. GUSTINE. I think perhaps that we don't need new legislation but we do need some regulations that clearly define the role and the application of the Fitzgerald Act. In my short tenure in the Washington, D.C. area I have seen what can be done in the writing of regulations that apply to legislation, and then the subsequent interpretation that is placed on those regulations, which builds a lot of latitude for whatever administration happens to be in place at the time.

If there were some way of narrowing the latitude that exists and providing some more consistency in the application, in the intent and philosophy of the Fitzgerald Act, that's what we really need.

Mr. ERLENBORN. Thank you. Thank you, Mr. Chairman.

Mr. HAWKINS. Mr. Hayes.

Mr. HAYES. In the interest of time I'm just going to raise one question.

Is there any—have you noticed any adverse impact on your whole apprenticeship training program that you've conducted, the association here, that has resulted from the Government's change in its position in terms of funding of certain vocational school programs, CETA programs, and things of this sort which were designed primarily to help the underprivileged prepare themselves to fit into these kinds of things?

Mr. GUSTINE. Mr. Hayes, the International Brotherhood of Painters & Allied Trades has participated in the affirmative action programs that were financed by the Federal Government since 1968. We had our first national MDTA contract at that time. We entered into the Job Corps program at the end of 1968.

We considered our activity a partnership with the Federal Government in achieving the goals of the legislation. We think that was a very successful partnership. Unfortunately, our national CETA contract came to an end with the demise of CETA and the advent of JTPA and the new philosophy of the current administration regarding the training program. It's essentially to remove any Federal responsibility for same and delegate it to the States.

I think by doing so they have eliminated a very, very valuable resource that exists in the apprenticeship system today, that is, the national structure of the painters and certainly all of the construction trades.

We have a network that's alive and well out there conducting training throughout the United States. Through our national contracts we were able to target areas of the country where we could put that money to best use. We no longer can do that. That's wrong. We still participate in the Job Corps program. We have an extensive program within Job Corps and we're pleased to be there. Continuing participation is being called into question today for various and sundry reasons.

Job Corps has the potential of being a truly outstanding program to serve disadvantaged youth in this country. Its function, I believe, has deteriorated in the last few years and unless philosophy changes, will continue to deteriorate.

Mr. ROBERTSON. Anyone else?

Mr. HAWKINS. Do you care to comment, Mr. Robertson?

Mr. ROBERTSON. I would like to, if it's at all possible, to make one last comment on the fragmentation issue.

Mr. Hawkins, yes, fine. Were you through, Mr. Gustine?

Mr. GUSTINE. Yes.

Mr. HAWKINS. Mr. Robertson, go ahead.

Mr. ROBERTSON. Yes. On the fragmentation issue, this is of great concern to the building trades as well as the metal trades and affiliates. Under title 29, part 29 of the Code of Federal Regulations, the Bureau of Apprenticeship and Training has been registering new occupations at an alarming rate with complete disregard as to what this may do to an industry and a trade. What is our concern? The BAT, by registering some of these occupations which are already part of other occupations is fragmenting entire industries and, of course, the crafts themselves.

The results are clear. Whereas the traditional skilled craftsperson was equipped with enough skills to be versatile in the many facets of a trade, the new specialized worker will be skilled in only one area and is consequently much more vulnerable to the changing winds of the marketplace.

I think it's safe to say that title 29, part 29 is being abused somewhat in the sense that in order to get around the Davis-Bacon Act, a new apprenticeshipable occupation is created which is already part of another registered occupation. When this occurs, lower wage rates are established for this new occupation which, in turn, automatically disrupts bidding by other contractors who are working within the wage structure of the previous registered occupation that included the same type of construction.

Also, this trade fragmentation does not serve to safeguard the welfare of apprentices, especially those who are being trained for the same type of work. One other point, very few apprentices are ever trained in these fragmented situations. As Dr. Glover pointed out in his testimony, more than half of the 738 occupations deemed apprenticeable by the BAT do not have more than 10 active apprentices in training nationwide.

In 1978 there were 149 apprenticeable occupations without a single apprentice.

You know, this comes up with—what happens, by fragmenting, what they're attempting to do, is to take—and I'll use the iron working trade, if you divide the iron working trade, for example, into 10 or 12 occupations, in an attempt to do this, what happens is when that, when that takes place, that individual, only working on the one part of the overall trade, will consequently be unemployed, because if that particular job or job operation finishes, then unlike the all-around skilled craftsmen, he will not be able to go to the next job, and we're very concerned about that.

I could use my own experience. When I served my apprenticeship I learned as part of my training to be a certified welder among all the facets of the trade, we have reinforcing, we have posttensioning, structural, and because of that, being—when I was laid off in one instance I went to the union hall and there were not too many jobs available, but there were jobs available for certified welders, because I had learned to be a welder in my apprenticeship, I was able to then go out and be gainfully employed, and this is what we're concerned about.

We want the individual to be employable, not work for a period of time on the job and then that job finishes and there are no other jobs just like that and what happens is you have a lot of people sitting at home. We want them to be able to be portable, to go to another job, and work in that, on that particular job operation.

So, in order to prevent this fragmentation problem it has been suggested that once an occupation has been registered, describing all the work processes, the BAT would be prevented from registering new apprenticeable occupations that have already been previously registered within another occupation. In this way the apprentice's welfare can be protected. I just wanted to point that out.

Mr. HAWKINS. You're suggesting that that be written into law?

Mr. ROBERTSON. Yes.

Mr. HAWKINS. My understanding is that this has been done by regulation.

Mr. ROBERTSON. Yes. Well, it would be written into the regulation is what I am suggesting. Right now it's in 29-29 and we suggest that an additional paragraph be added.

Mr. HAWKINS. Well, if the Department of Labor is doing this by regulation, you are suggesting that they—how would they change if this at present, their present position, to fragment rather than do it through other means?

Where is the impetus for this coming, from the Department of Labor, from joint management committees or from the unions or from the management?

Mr. ROBERTSON. It's coming from the BAT and under 29-29.

Mr. ERLENBORN. Would the chairman yield?

Mr. HAWKINS. Yes, I'll be glad to yield.

Mr. ERLENBORN. Does the BAT, in these instances, act as a self starter? Do they just dream up the idea of creating a new sub specialty?

Mr. ROBERTSON. No, they are requested.

Mr. ERLENBORN. There are requests from outside?

Mr. ROBERTSON. Outside to register a particular occupation. And then they must meet their criteria under the 29-29, with a minimum of what, 2,000 hours.

Mr. ERLENBORN. Where do those requests come from?

Mr. ROBERTSON. From various employers, employer groups. That's—they petitioned the BAT and at which time a decision is made whether to register that particular occupation.

What they're not taking into consideration is that it's already part of another occupation, and there's been a lot of discussion and a lot of debate on that and a lot of controversy, I might say. I just wanted to comment on that.

Mr. TAYLOR. May I just add one comment, insofar as the impetus, that if my memory serves me correctly, the impetus for title 29, part 29, was part of the State-Federal discussion many years ago as to the establishment of a set of standards that would, in fact, categorize an apprenticeable occupation. During the course, in the process, of putting together this proposed regulation, there was ample time for everyone to comment on what was going into the regulation and I think the position of the building trades is consistent, that the building trades and the individual crafts opposed the insertion of the 2,000 hours, which then opened, kind of, Pandora's box. It was the intent, I think, that this would then create a large number of occupations where people could enter a bona fide apprenticeship.

But at least since 1977 I just have not seen, and I don't think any of my colleagues here have seen a tremendous increase except breaking up of traditional crafts into segments of that occupation.

Mr. HAWKINS. It's not clear to me whether or not these regulations are just simply changed without comment or without hearings, or I—that seems almost unlikely.

Mr. TAYLOR. Oh, they were published and there was ample time for comment. But the comments were ignored.

Mr. HAWKINS. I see.

Yes, Mr. Gustine.

Mr. GUSTINE. One of the areas of discussion during these hearings and some of the questions that were asked dealt with the role of vocational education in apprenticeship and as practitioners of the art it's been stated that the building trades represent somewhere between 50 and 65 percent of apprenticeship in this country.

I would like to offer for the record just some comments on what their role might be, and I would like to start with a couple of basic definitions. Vocational education is a public sector educational system, publicly funded to serve public need. Perceived public need is, I believe, to prepare young people for successful entry into the real world of work.

Apprenticeship is primarily a voluntary, private sector, training system, funded by industries within the private sector, to serve that industry's training needs. The needs of the apprenticeship system from vocational education are the same as those of all employers, whether or not they participate in the apprenticeship program. Job applicants that are interested, enthusiastic, motivated, and qualified, that is, they meet the minimum entry level standards that are either established by the industry or the individual employers.

The role of vocational education in all of this is, I believe, to graduate from the system young people who possess a solid foundation of marketable, basic skills, skills that are needed at the entry level in the widest possible field of careers. So when their initial choice of jobs in the real world of work is made, it's based on an interest and a desire, not on a lack of education or awareness of existing opportunities.

If this role is fulfilled by vocational education, much of our discussion on dropout rate, need for outreach, need for remedial education, preapprenticeship training, outreach efforts to bring women into nontraditional employment, time-based as opposed to comp-based training, a lot of those problems would be alleviated.

What vocational education must not become is a factory for human robots, turned out to narrowly defined job specifications, by a single employer or specialty industry who, when they are no longer needed or a new model is turned out by the factory, are discarded and then perhaps show up knocking at the door of apprenticeship sponsors, because they're no longer qualified to be employed in what was supposed to be their career's work.

Mr. HAWKINS. Thank you, Mr. Gustine.

We obviously have more questions but time does not permit. I would like to thank the witnesses again for their presentation and indicate that you've done, I think, an excellent job of presenting your views. Thank you.

Mr. ROBERTSON. Thank you, Mr. Chairman.

Mr. HAWKINS. The next witness is Mr. Paul Burnsky, Metal Trades Department of the AFL-CIO. Mr. Burnsky, we welcome you before the committee.

Is Mr. Wesley Paine, Sr., here?

Mr. BURNSKY. Yes; he's present.

Mr. HAWKINS. We'd be glad to have you be a part of the panel of the metal trades.

All of the written testimony will be entered in the record in its entirety and because we're running out of time, gentlemen, I would appreciate brevity and the highlights of your presentation. Otherwise, we may have some bills soon and we may lose members, I'm afraid. I apologize for that, but that's the way of life.

Mr. Burnsky.

[The prepared statement of Paul J. Burnsky follows:]

### PREPARED STATEMENT OF PAUL J. BURNSKY, PRESIDENT, METAL TRADES DEPARTMENT, AFL-CIO

Mr. Chairman, my name is Paul J. Burnsky. I am President of the AFL-CIO Metal Trades Department. Our Department represents U.S. naval shipyard workers and most skilled workers in major commercial shipyards, in atomic energy facilities, NASA installations, petro-chemical industries, and nonferrous mining and processing plants, under collective bargaining agreements negotiated by our various local and district councils. These views are presented in behalf of the almost 5 million members of the 21 national and international unions that make up the Metal Trades Department, AFL-CIO. A list of these affiliated unions is attached to my testimony.

Before proceeding, I would like to thank you, Mr. Chairman, for scheduling these oversight hearings by your Subcommittee. They are timely and of great importance, not only to the future of the apprenticeship program itself, but because of the relationship to other national issues. The erosion of our shipbuilding industrial base and the efforts to rebuild our U.S. maritime and shipbuilding programs are directly linked to the effective operation of the apprenticeship program. It directly affects our ability to produce the quantity and quality of U.S. naval vessels to protect our national security and to construct modern, efficient cargo ships to carry our goods in world trade.

Whether we're talking about building ships, planes, space vehicles or nuclear energy, the point I'm making is the same. We have generally accepted the nation's need for trained scientists, physicists, engineers of all types, and other high technology technicians. We spend billions of dollars each year in public and private funds for higher education and advanced degree scientific programs.

Certainly, these scientific contributions are important in the design and conceptualization of industrial productive endeavor. But it is the skilled journeyman craftsman who has the training and the skill necessary to actually translate that scientific/technical concept into the finished product. It is the journeyman, working with the engineer and scientist, who can take a blueprint and a mass of cold, unformed metal and machine it to a ten-thousandth of an inch, or to no tolerance at all. Journeymen make the experimental models and then set up the production jobs that can turn out the completed product. Scientists can't do that; neither can engineers, or other types of technicians.

It is no overstatement on my part, Mr. Chairman, to say that in November, 1983, our national/state apprenticeship system that has served us so well over the many years since enactment of the Fitzgerald Act in 1937 is in trouble—serious trouble. We of the Metal Trades Department are no "johnnies come lately" in our support and vigorous promotion of the apprenticeship program. It is true that in the public mind, apprenticeship has been most popularly connected with the building trades. But over the years, on the railroads, in the shipyards of our nation, in manufacturing industries of all types, apprenticeship in the metal trades has been highly visible and of major importance in our nation's industrial development in the past 40 years. As a machinist by trade, I can assure you that our apprenticeship programs have a proud tradition of quality over the years. A number of our affiliated unions are also members of the building trades and for more than two decades our Department and the Building and Construction Trades Department have had a Joint Apprenticeship Committee.

All of our apprenticeship programs in the metal trades have positive affirmative action plans and participation is open to all who qualify, regardless of race, gender, color, creed, or national origin. We are proud of our role in opening up our programs to all Americans. Equal rights and equal opportunity are closer to full realization in our unions, in our workplaces, and in our training and apprenticeship programs than in any other part of our society.

The long-term value of our apprenticeship system has been proven over the years. It has developed as a continuing cooperative effort among workers, employers, and government.

Government promotes apprenticeship and assures high standards of excellence for each apprenticeship category; workers give up monetary compensation during their training; and employers provide the training facility in return for an assured supply of skilled production workers. Workers, in turn, gain the ability to advance themselves economically through their own knowledge and application to their skilled trade. Employers then have a pool on which to draw for supervisory employees, as well as the increased efficiency and productivity that skilled journeymen bring to the production line. And the nation as a whole benefits through increased gross national product, our supply or human and industrial resources, and in the strengthening of our national security.

Mr. Chairman, when I said that our apprenticeship system is in serious trouble today, let me point out that I am not comfortable in any Cassandra-like role. However, there are many reasons why I feel such is the case. Among them are basic changes that have been taking place in our industrial economy; the decline of productive capacity in the steel industry and other basic "smoke stack" industries; the impact of foreign "targeting" of other U.A. industries, such as machine tool companies; increasing competition in the automobile industry from foreign car makers; and in our shipbuilding industry, the foreign government-subsidized shipyards and cheap labor that have dried up domestic orders for commercial vessels in U.S. yards. These and other factors, such as the rise of "high technology" industries in the U.S., have sharply reduced the numbers of job opportunities in traditional American industries that comprise our heavy industry production base. All of these industrial upheavals have been compounded by the record high levels of industrial unemployment and the uncertainties among the young people interested in careers to skill areas in metal trades, as to whether or not to enter comprehensive apprenticeship training, that could be a dead end technological road leading to a row of closed industrial plants.

The erosion of the apprenticeship system is all too evident. The program is obviously no longer important to the Labor Department. The office of Director of the Bureau of Apprenticeship and Training (BAT) has been vacant for almost a year, with no sign that it will be filled. From a high of 537 employees in 1965, BAT's personnel ceiling was slashed to 278 in fiscal year 1983, with many slots vacant. In fiscal year 1984 the ceiling will be little over 200. Reduction in force (RIF) notices have fallen disproportionally heavy on BAT, compared with other offices. Sharp cuts in travel expenses in BAT regional offices have made it virtually impossible for employees of the Bureau to site visit apprenticeship programs to assure that they are in compliance with the basic principles of the system. Since the end of 1979, the Bureau no longer maintains statistical data on the apprenticeship programs, numbers of enrollees, training status by program, numbers of graduates, or other types of statistical information that had been collected regularly for many decades to help measure the system's progress.

A recent study of machinists and tool and die makers reveals that their average ages are 58 years and 47 years, respectively, but fewer and fewer young people are entering apprenticeship programs in these fields that have traditionally been the mainstay of American industrial might. The Department of Labor last year estimated that we will need nearly 9,000 tool and die makers and some 22,000 new machinists each year through 1985. Because of the relatively high age levels of workers in these fields, attrition will account for an estimated 19,000 of these annual number of vacancies. However, the number of new journeymen for both of these key skill trades amounts to only 5,000 per year according to the Bureau of Apprenticeship and Training. Here is a most disturbing paradox, Mr. Chairman, that when unemployment has stood at the highest levels since the 1930's, we have severe shortages in major skill trade areas on which the viability of our nation's industrial base in large part must depend. Similar patterns exist in other key journeymen fields. But in other cases, apprenticeship programs have been discontinued altogether because of a dimmed economic and job future in certain industries sufficient to attract promising young people.

Few American industries and workers have been more adversely affected by this latter problem than in our shipbuilding industry. Despite the recent buildup of our U.S. Navy and the increases in number and variety of new ships being built, plus conversion, refitting, and modernization work in our shipyards, the number of skilled shipyard workers has been steadily declining over the past 5 years in commercial ship construction and repair work. From a peak of some 48,000, such commercial shipyard workers in 1977, we expect that less than 15,000 such skilled workers will be employed by the end of this year. While some have been able to find jobs in Navy shipyards, the vast majority of those laid off have left the shipyard workforce for other jobs, have retired, or are otherwise no longer a part of the shipbuilding manpower base.

This problem has major national security implications, made worse by the practical difficulties involved in seeking to match skill shortages in one geographic area with layoffs of other workers across the country. Recent testimony by Richard DeLauer, Under Secretary of Defense for Research and Engineering, pointed out their major concern over dwindling supplies of skilled manpower in defense industries. He said that more than half of the skilled tool and die makers in the U.S. will retire within the next 8 years and that the machine tool industry is producing only 25 percent of the skilled journeymen needed each year to replace those lost through attrition.

It is a truism, Mr. Chairman, that a skilled mobilization workforce cannot be "mothballed" until needed to rapidly increase our industrial output in a time of emergency. A recent study by the Navy Department and the Maritime Administration estimates that the shipyard mobilization base will require some 40,000 skilled shipyard workers over the next 5 years, plus an additional 60,000 trained workers if we were confronted with a wartime emergency. Large numbers of skilled shipyard workers laid off during the severe economic recession in the industry have been lost forever, along with countless man-years of experience in shipbuilding crafts—electricians, plumbers, ironworkers, boilermakers, machinists, sheet metal workers, pipefitters, painters, and dozens of other skilled tradesmen. A revitalization of our American commercial shipbuilding capability, strongly supported by our Department and the AFL-CIO to restore the U.S. Merchant Marine to a competitive level will impose still additional demands for skilled shipyard workers beyond that needed for our naval forces and for our shipyard mobilization base for national security purposes.

Where are the apprenticeship programs to meet these needs? Where is the national program to preserve our American industrial machinery that made us the world leader and gave us the world's highest standard of living?

I, for one, Mr. Chairman am not ready to relegate America to an economic order that limits us to being only the world's "breadbasket" in the production and export of farm commodities and the exporter of "high-tech" knowhow, computer software, and information technology. How would our becoming the world leader in retailing, hamburger innovation, entertainment enterprises, or in leisure time utilization really strengthen us as a nation? We must never lose the dynamic industrial capability that has made America strong. We must never turn over to foreign nations our industrial knowhow, our petrochemical and metalurgical leadership that have always signaled our progress, just because it has become more difficult for American industry to compete with offshore producers. Those governments which own or heavily subsidize their means of production often exploit their country's workforce for international trading advantages. How can there be "fair competition" under such circumstances? We must not, as a historic maritime leader in the world, permit our American shipbuilding capability to wither away, eventually making us a virtual captive nation relying on the skills and productive resources of other countries for our survival in a hostile world. The price foreign nations might demand in such a tragic situation could well be beyond our ability or wilingness to pay. Freedom and independence as a strong nation, capable of fulfilling our domestic economic needs and preserving our national security demands that we maintain our basic industrial strength and sufficiently modernize our industries and work force to meet any challenge from abroad.

Mr. Chairman, in some quarters it has become popular to say that the time-tested apprenticeship system has become outmoded because of the changing technology of our workforce and the more glamorous appeal of "high-tech" skills. I do not believe this to be the case in practical terms. The skills of an experienced journeyman in any field are flexible and transferable. Apprenticeship training combines a thorough, broadly based knowledge of the craft, its practical, as well as theoretical applications, with down-to-earth on-the-job training experiences. It brings the apprentice into the real world in applying the job skills learned in the classroom to the actual work setting. The apprenticeship system isn't easy, quick, or inexpensive. But the development of quality, highly skilled, and practically trained craftsmen through apprenticeship programs is recognized by most employers as the superior end product.

Skilled craftsmen with practical knowledge and experience in the workplace are even more essential than ever because of newly emerging production technology, more sophisticated machinery, assembly techniques, and other technological innovations. For example, in my own craft—a high degree of flexibility has been built into the apprenticeship program. A machinist in a plant that manufactures "widgets" can be switched—with little or no difficulty—to a line that is turning out "gizmoes." A journeyman who has learned the basic techniques as an apprentice can adjust to a related skill job, usually without extensive retraining.

But there has been a steady decline in the numbers of apprentices being trained in programs registered with the Bureau of Apprenticeship and Training. Less than 34,000 registered apprentices are being trained for the metal working trades, according to most recent figures available. Of that total only 16,727 are learning to be all-around journeyman machinists, while only 14,258 are being trained as tool and die makers. The apprenticeship training is rigorous and the completion rate will be only a fraction of these figures. As I have pointed out earlier, the demand is in far greater excess for these key crafts because of current age levels and resulting high attrition rates. Actual completion rates for apprenticeship training in these and other craft areas are much below enrollment. Most metal working unions accept 10 percent apprentices; most often we are fortunate to get even 1 percent.

Changes in direction and administrative interpretations of job training and their application to the apprenticeship training program have resulted in an unwarranted fragmentation of various crafts, reversing a long-standing Bureau policy that apprenticeable trades and crafts should be more unified. From a manageable number of apprenticed trades, there has been a proliferation of such categories of training—almost 100 in number—from aircraft fabricator to woodcarver. Within these categories there are more than 400 subcategories, each one of them an officially recognized craft. As of September, 1983, there are 783 occupations recognized as apprenticeable by the Bureau of Apprenticeship and Training. For example, there are 9 distinct apprenticeable crafts that fall under the general category title of "Painter and Decorator." Such proliferation tends to blur the important differences between the apprenticeship system and more recently enacted job training programs. The apprenticeship system, we have long argued, should not be subjected to excessive governmental regulation beyond its role in assuring that appropriate minimum standards are met in apprenticeship training. Administrative fragmentation of the basic crafts is contrary to the basic principles and objectives of the apprenticeship system. Unwarranted proliferation of job classifications by administrative fiat can result in the gutting of established and highly successful labor-management apprenticeship programs.

At least part of the difficulty seems to be shifts in policy direction resulting from newer job training programs enacted by Congress. The basic differences between job training and apprenticeship programs must be clearly understood. A job training program is one that prepares workers to perform a specific task, or a range of tasks that are tied to a specific company's product line, or operation, or to those of a specific industry. Such "tailored" job training is useful. It instills good work habits. It upgrades educational opportunities and provides experience in interpersonal relations. It lays a foundation for future work progress. But such job training programs, while helping to achieve individual worker objectives and a level of skills, are not the same as apprenticeship. Every apprenticeship program, must, in fact, be certified as meeting necessary standards to equip its successful graduates with the broad, flexible, transferable skills of the true journeyman.

By contrast, however, the newly issued regulations for the Job Training Partnership Act have, in the opinion of many of us, already violated basic Congressional intent. Local job training plans qualifying for grants may, in some cases, duplicate apprenticeship programs already in operation or move into fragmented portions of occupations included in the registered program.

The Metal Trades Department, our individual unions, and the AFL-CIO as a body have long been active in our vigorous support of major job training programs such as the Manpower Development and Training Act, the Comprehensive Employment and Training Act, the Jobs Partnership Training Act, and other similar measures.

These programs have been designed to meet special training needs of large segments of our entry level population. They have been of value to the disadvantaged, the school dropouts, those lacking basic literacy skills, and minorities. They also provide needed training and retraining opportunities for the unemployed, those caught in the squeeze over plant closings, technologically declining industries, and other types of specialized job-related situations.

Mr. Chairman, Congress never intended that these specialized job training programs should, or could be substitutes for the apprenticeship system. Certainly, many of those starting out in MDTA or CETA programs have gone on to enter a certified apprenticeship program at some later time and have been successful in achieving journeyman status. Unfortunately, I believe that in the Federal and local administration of the specialized job training programs there has been a tendency to lose track of the basic principles and purposes of the apprenticeship system, and how it should relate to these other programs and their shorter term objectives.

Much of the specialized job training being conducted today is in "tailored," or "job specific" categories. Persons are often trained for individual employers for specific types of jobs in a particular plant—jobs that are narrow in the scope of the skills required, requiring short time periods for such training. Often these types of jobs are short term in highly volatile economic situations. For example, a manufacturer wants to build his inventory of "widgets," and decides to hire 50 workers to reopen two of his plant's assembly lines. Many of those who were laid off when the lines were shut down six months earlier are no longer in the local workforce, having taken other jobs or moved away. It is therefore necessary to train 20–30 new employees to the particular assembly line skill required. So the employer takes advantage of one of the Federal job training programs, including the tax incentives available, and arranges for such training to take place. Unfortunately, in such situations those newly trained workers may not end up with permanent jobs once the inventory is replenished and the assembly line is again shut down.

Since such workers have been trained for only a narrow, specialized job skill, these skills are difficult to transfer to other potential job situations and the individual attains little job mobility as a result of his training. Certainly, no one would argue that in this scenario, there has been no value to the program. The worker has received some job training, albeit highly specialized, and has no doubt benefited from the practical job experience on the assembly line. Certainly, he has received economic benefits through his wages and the employer has likewise benefited economically and by receiving tax advantages. Finally, government has benefited through savings in unemployment or welfare costs if the trainee is placed in a productive job, and through additional tax revenues from the former trainee's salary on the job and in employer's profits.

The point I'm trying to make here, Mr. Chairman, is that our industrialized society has room for both types of job training approaches. The career-oriented, highly skilled apprenticeship system, the product of labor-management cooperation and governmental promotion, featues in-depth study, practical experience, and on-the-job training over a long period of time, with commensurate long term economic rewards. It stresses flexibility in a particular craft field, with full transfer capability of the journeyman to related jobs in his craft with little or no additional retraining requirement. We need a mix of both the "job specific" type of training, for shorter range objectives, and that provided through the apprenticeship system. A career bridge from semi-skilled, entry level jobs to permit the upgrading of these skills is essential to avoid, as far as possible, the peak and through, hire and layoff fluctuations resulting from national economic trends.

But the administrative philosophy governing the conduct of specialized job training programs should not be permitted to spill over to the apprenticeship system and to distort its principles and operations that have proved so successful over the years. The administrative actions proliferating the numbers of subdivisions within crafts, as discussed earlier, results in "mongrelization" of skilled crafts. Such action reflects the "job specific," short-term type of job training philosophy of governmental administrators. Their role in the apprenticeship system should not extend into the rearrangement of designations within craft areas that upsets the functioning of established and highly successful apprenticeship programs negotiated by labor and management to fulfill their skilled job requirements. Rather, governmental partners in the cooperative apprenticeship triad with labor and management should exercise their traditional role of being the promoter and advocate of the apprenticeship system, and act as the vigilant protector against efforts by other governmental administrators of job training programs to impose the narrow assembly line training concept on the apprenticeship structure.

But much more is involved here than a clash of conflicting job training philosophies. Major public policy issues far transcend the specifics of the myriad of job training options. One of the hard realities emerging thus far in the 1980's is that the United States no longer can be secure in its claim to world technological leadership. Other nations have caught up in many areas, and surpassed us in some others. Competition from foreign producers in virtually all major manufacturing product areas is keen, not only in the world market, but here in the U.S. In fact, we have already heard much lately about the "quality" of foreign-produced products when contrasted with American-made counterparts, often viewed by the public as being shoddy, overpriced, or inferior. Obviously, for us to reverse this view and to dramatically improve our ability to compete at home and abroad, American industry must raise our productivity levels and significantly improve the overall quality of our manufactured products. Dozens of national economic game plans have been suggested to accomplish this important goal involving efforts of management, labor, and government and I will not attempt to discuss them here.

Within the context of these hearings, however, I would point out that one of the hallmarks of the apprenticeship system down through the years has been our fierce dedication to high quality and efficient production objectives. The pride of performing quality work is an integral part of the apprenticeship system, instilled from the earliest day of an apprentice's training. A skilled journeyman is a high-productivity worker. He knows his craft and how to use his tools properly. He needs less supervision and can anticipate problems on the job and know how to avoid them. He has a personal vested interest in doing his job well because he, in fact, has made a considerable investment of time and money by agreeing to forego some income during his apprenticeship period in order to gain the opportunity for later economic gain. The apprenticeship system is one of the best working examples of the successful partnerships between labor, management, and government. As the apprentice sacrifices income, the employer is deferring a portion of productivity in order to maintain a supply of highly productive journeymen. The government contributes neutral assurance that proper training standards are fulfilled, with only a minimum Federal expenditure.

I am not suggesting that the apprenticeship system should be applied to every industrial occupation. However, experience has shown that for highly skilled and technically complex occupations, apprenticeship programs offer the most efficient means of producing a highly productive workforce. If our current search for industrial revitalization is to be successful, it is only common sense that we continue to do what works and to spread the apprenticeship system concept to every type of endeavor to which it is relevant.

Mr. Chairman, it is for all of these reasons and our firm belief that the apprenticeship system has significant future application to the changing industrial technology of the 1980's and beyond that we pledge our full cooperation to efforts of this subcommittee to strengthen the role of apprenticeship training in the United States. We respectfully suggest that the subcommittee consider the creation of a special apprenticeship commission to study specific ways in which the system can be strengthened and how workable principles of apprenticeship might be incorporated into other segments of our industrial society. The Metal Trades Department would welcome the opportunity to contribute our experience and knowledge of how the apprenticeship program has helped to enhance worker productivity and quality production as part of such an effort. Hopefully, such a broadly based commission, made up of apprenticeship leaders in industry, labor, and educational sectors, could recommend leglislation in the next Congress that would offer positive approaches to strengthen the apprenticeship system.

Thank you for the opportunity to present these views for your consideration.

### INTERNATIONAL UNIONS AFFILIATED WITH METAL TRADES DEPARTMENT, AFL-CIO

International Association of Heat and Frost Insulators and Asbestos Workers.

International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers.

United Brotherhood of Carpenters and Joiners.

International Chemical Workers Union.

International Brotherhood of Electrical Workers.

International Union of Elevator Constructors.

International Union of Operating Engineers.

International Brotherhood of Firemen and Oilers.

International Association of Bridge, Structural and Ornamental Iron Workers.

Laborers' International Union of North America.

International Association of Machinists and Aerospace Workers.

International Molders and Allied Workers Union.

Office and Professional Employees International Union.

International Brotherhood of Painters and Allied Trades of the United States and Canada.

Operative Plasterers' and Cement Masons' International Association of the United States and Canada.

United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada.

Service Employees International Union.

Sheet Metal Workers International Association.

Stove, Furnace and Allied Appliance Workers of North America.
International Federation of Professional and Technical Engineers.
Upholsterers' International Union of North America.

## STATEMENT OF PAUL BURNSKY, METAL TRADES DEPARTMENT, AFL-CIO

Mr. **Burnsky**. We have a statement for the record and I have a summary of that statement.

Mr. **Hawkins**. Thank you.

Mr. **Burnsky**. Mr. Chairman, my name is Paul J. Burnsky. I am president of the AFL-CIO Metal Trades Department. I have with me Ray Robertson of the International Association of Bridge, Structural, & Ornamental Iron Workers and Ken Edwards of the International Brotherhood of Electrical Workers, and Bill Holiater of the International Association of Machinists & Aerospace Workers, who are experienced and knowledgeable experts on apprenticeship programs. They will be available for questions at the conclusion of my remarks. In fact, Ray Robertson is the chairman of our Joint Apprenticeship Committee and Ken Edwards is the secretary-treasurer of our Joint Metal Trades-Building Trades Apprenticeship Committee.

Our department represents all U.S. naval shipyard production workers and most production workers in the major shipyards, under collective bargaining agreements negotiated by our local and district councils.

My views are presented on behalf of the almost 5 million members of the national and international unions that make up the Metal Trades Department. A list of these affiliated unions is attached to the testimony which I would like to introduce for the record and for your consideration.

Mr. **Hawkins**. It will be so included, without objection.

Mr. **Burnsky**. Thank you.

My remarks which follow summarize that testimony and I wish to thank you for scheduling these oversight hearings. They are long overdue. I understand the last meeting that was held was 21 years ago on apprenticeship.

Mr. **Hawkins**. Mr. Erlenborn might have been at that one. I wasn't. [Laughter.]

Mr. **Erlenborn**. I was at that one? Son of a gun!

Mr. **Burnsky**. I believe they are urgently needed in view of the serious implications for our national well-being resulting from the strangulation of an apprenticeship system which has proved itself a major component of our industrial abilities. The link between effective operation of our shipbuilding industrial base and the effective functioning of the apprenticeship program provides a highly evident example of our need for a steady, sufficient, supply of the trained, efficient workers provided by apprenticeship training.

A recent Federal study estimates that the need of 40,000 skilled shipyard workers over the next 5 years, plus an additional 60,000 if we are confronted by a wartime emergency. They are not being trained, and the same lack of foresight is all too evident in other industrial pursuits. The time is rapidly approaching when we will have lost our capacity to translate our national genius for technical invention into practical end results.

Whether we're talking about building ships, planes, space vehicles, or nuclear energy, the point I am making is the same. We have generally accepted the Nation's need for trained scientists, physicists, and engineers. We spend billions of dollars each year in public and private funds for higher education and advanced degree scientific programs. But skilled journeyman craftsmen are necessary to translate scientific-technical concepts into finished products. It is a journeyman, working with engineers and scientists, who takes a blueprint and a mass of cold, unformed metal, and machines it to one ten-thousandth of an inch or to no tolerance at all.

Journeymen make the experimental models and then set up the production jobs that turn out the complete products. Scientists can't do that. Neither can engineers or other types of technicians. Yet, we are choking off the supply of these journeymen through neglect of the apprenticeship system.

The technological change we are going through and the economic disasters of the past several years are only a part of the reason for that neglect. We have met and conquered those same problems in the past. We now face a vastly more threatening problem in the active dismantling of Federal apprenticeship training programs by the present administration.

The Department of Labor estimates we need, for example, nearly 9,000 tool and diemakers and some 22,000 new machinists each year. It is increasingly evident that the apprenticeship programs that could provide these and other necessary skilled craftsmen are of no importance to the Labor Department.

The office of Director of the Bureau of Apprenticeship and Training, that, has been vacant for almost a year. From a high of 572 employees in 1965, BAT's personnel ceiling has been slashed to 291 in fiscal year 1983. In fiscal year 1984 the ceiling will be a little over 200. Many of the positions remain unfilled. Sharp cuts in travel funds have made it impossible for the Bureau to monitor programs and statistical programs have been abolished. The work of the Bureau just isn't being done.

In addition, apprenticeship programs are being converted contrary to the will of Congress into job training programs that train workers for limited, dead-end jobs. We recognize the needs for job training programs and we support them, as well as the concept of equal opportunity they represent. But we recognize that job training and apprenticeship programs have different goals and address different needs.

The fragmentation of crafts and skills that results from abolishing apprenticeship programs and replacing them with limited training has a direct impact on national economic goals. It gives immediate financial bonanzas to employers while depriving our Nation of its pool of skills necessary for industrial progress.

The apprenticeship program is a working, successful partnership between labor, management, and government. The apprentice gives up immediate financial remuneration for the sake of future advancement. Industry gives up some immediate productivity for improved future stability and efficiency of the work force.

Government, at a minor cost, insures the necessary standards are established and maintained. If we believe it is absolutely vital for our Nation's future that we maintain a strong, functioning apprenticeship program we respectfully suggest you consider creating a special apprenticeship commission to study specific ways of incorporating the proven principles of apprenticeship into all appropriate segments of our industrial society. We would welcome the opportunity to contribute our experience to such a commission as part of a contribution by labor, industry, government, and academic authorities that would hopefully recommend legislation in the next Congress.

Thank you for the opportunity to present these views for your consideration.

Mr. HAWKINS. Thank you, Mr. Burnsky. Mr. Payne, did you have a statement to present at this time?

[The prepared statement of Wesley P. Payne follows:]

## PREPARED STATEMENT OF WESLEY D. PAYNE, SENIOR VICE PRESIDENT OF PRODUCTION, NORFOLK SHIPBUILDING & DRYDOCK CORP.

### APPRENTICE PROGRAM FOR THE MARITIME INDUSTRY

Mr. Chairman and members of the Committee, I am Wesley D. Payne, Senior Vice President of Production, representing Norfolk Shipbuilding and Drydock Corporation and the Shipbuilders Council of America. The Shipbuilders Council of America represents the principal domestic shipbuilders, ship repairers, and suppliers of equipment and services to those industries. A copy of the Council's membership list is attached to this statement. I request that my entire statement be included in the record.

For years, the shipbuilding industry has provided significant training and development opportunities for young people who were looking for a way to develop special industrial skills. Through the apprenticeship concepts, many maritime companies with medium to large size workforces set up a formal program of training to insure the availability of a skilled workforce in the future. The basic process is one of identifying potential apprentices through an application process. Usually, an applicant would be a high school graduate with a background in math and, possibly, science. An applicant would also be expected to demonstrate certain mechanical and/or physical capabilities that would allow him or her to perform the arduous tasks often connected to ship repair and construction.

Shipyards have traditionally controlled both the academic and on-the-job training of the apprentice with its own in-house staff of instructors. Although the instructors are sometimes contracted for through private or public training agencies, the management of the shipyard, working with a union in some cases, maintains control of the operation. In practice, about 80 percent of an apprentice's time is spent actually on a productive job. The other 20 percent is spent in academic or trade theory classes and labs. Classes in mathematics, science, drafting and blueprint reading, shipbuilding theory, safety, economics and marine engineering are typical courses in the academic portion of the programs. Specific trade theory courses are taught consistent with the trade requirements. This will vary from 300 to 1,000 hours of study depending on the length of the apprenticeship and the difficulty of the trade. At the present time, most shipyard connected apprenticeships range from three to five years.

Until the mid sixties, most shipyard apprenticeship programs were filled almost exclusively by white male applicants between the ages of 18 and 25. At that time, many companies opened their programs to minority males. It wasn't until early in the seventies that shipyard apprentice programs were opened to female applicants. Today, women and minorities compose a significant percentage of shipyard workforces; in fact, a higher percentage than most industries considered to be non-traditional for women and minorities. For example, the first female to graduate from the NORSHIPCO apprentice program did so in 1976. In fact, only 51 females were hired as apprentices from 1972 through 1978 and only eight graduated. In 1982 alone, there were 34 females in training in all three years of the program. Ten graduated in December 1982, more than the first six years combined. Our results continue to indicate that selection practices and proper placement can insure greater success rates for females in shipyard apprenticeship programs.

During the same period, 518 males were hired and 186 graduated. Retention of males up to this point has been significantly better than female retention. Comparing white males to minority males, there is no discernible difference in retention rate.

A recent assessment of the reasons that both males and females voluntarily quit apprentice training indicated that there is a real lack of understanding on the part of the apprentice concerning the life of a shipyard mechanic. As a result, nearly one-third of the apprentices do not complete the first year. In an effort to combat this problem, NORSHIPCO has and is encouraging prospective apprentices to come into the yard as trainees or as helpers in order to determine what shipyard work is like and decide if the work is suitable for them. Likewise, the shipyard has an opportunity to evaluate the suitability of the worker as an apprentice. Over the past three years, those apprentices who were transferred from the general workforce or trainee positions, after three or more months in the yard, were twice as likely to still be in the apprentice program after the first year as those who came directly into the program from the outside.

Of course, the basis for any successful shipyard apprenticeship training program rests with two key elements. The first is a basic workforce consisting, among other things, of some genuine first-class mechanics. An apprentice cannot learn the trade unless he has an "on the job teacher," the mechanic. second, and just as important, is the necessity of something to work on - ships to build or repair. Without a reasonably constant workload, private industry is unable to maintain the apprenticeship program. When it comes down to laying off a mechanic with ten years experience or a second-year apprentice, the decision is clear.

NORSHIPCO, during the fall of 1982, had an apprentice program with over 350 apprentices. Today, we have 28. And we are in better shape than virtually any other private yard on the east coast who specializes in repair. The long term impact of this drastic reduction in apprentices is mindboggling when you consider that our graduating class of 1985 will be 15 instead of 125. This not only impacts the quality of our overall workforce but is indicative of the loss of the skilled shipyard trades which are dying for lack of use by commercial and government agencies. Without a viable apprenticeship system in the maritime industry, the skills for building and repairing ships will continue to erode.

Building or repairing a ship is said to be one of the most difficult tasks performed in our country today. During the past ten years, many of the skilled shipbuilders in this country have lost their jobs and thus their skills. The impact of this decline in skilled shipbuilders has become increasingly more evident as shipyards around the country seek skilled craftsmen to work in the shipbuilding industry. The simple fact is that many of the skills have and are being lost and, without a comprehensive apprenticeship system for all sizes of shipyards, the industry will not be able to meet the needs of our Nation. There is no way to give a new shipyard employee ten years of experience in two or three years. The skills are just too complex. Given the present situation of the industry and the projected demands for repair and rebuilding of both our merchant marine and our Navy, it is imperative that a strong industry-wide program to develop skilled shipyard workers be supported and encouraged.

ATTACHMENT A

REGULAR MEMBERS

ADDSCO Industries, Inc.
Post Office Box 1507
Mobile, AL 36601

The American Ship Building Co.
Suite 800
Lincoln Pointe Building
2502 Rocky Point Road
Tampa, FL 33607
Amship Division; Lorain, OH
Tampa Shipyards, Inc., Tampa, FL

Avondale Shipyards, Inc.
Post Office Box 50280
New Orleans, LA 70150

Bath Iron Works Corp.
700 Washington Street
Bath, ME 04530

Bay Shipbuilding Corp.
605 N. 3rd Avenue
Sturgeon Bay, WI 54235

Bethlehem Steel Corp.
Shipbuilding Division
Bethlehem, PA 18016
Beaumont, TX
Sparrows Point, MD

Coastal Dry Dock & Repair Corp.
Brooklyn Navy Yard
Building 131
Brooklyn, NY 11205

Dillingham Maritime Group
P. O. Box 4367
Portland, OR 97208

General Dynamics Corp.
Pierre Laclede Center
St. Louis, MO 63105
Electric Boat Division, Groton, CT
and Quonset Point, RI
Quincy Shipbuilding Division Quincy, MA
and Charleston, SC

General Ship Corp.
400 Border Street
East Boston, MA 02128

Ingalls Shipbuilding Division
Litton Industries
Post Office Box 149
Pascagoula, MS 39567

Jacksonville Shipyards, Inc.
750 East Bay Street
Post Office Box 2347
Jacksonville, FL 32203

Jeffboat, Incorporated
P. O. Box 610
1030 East Market Street
Jeffersonville, IN 47130

Lockheed Shipbuilding and
Construction Company
2929 Sixteenth Avenue, SW
Seattle, WA 98134

Marine Power & Equipment Co., Inc.
1441 North Northlake Way
Seattle, WA 98103

Marinette Marine Corp.
Ely Street
Marinette, WI 54143

Maryland Shipbuilding &
Drydock Co.
Post Office Box 537
Baltimore, MD 21203

National Steel & Shipbuilding Co.
Harbor Drive at Twenty-Eighth Street
Post Office Box 80278
San Diego, CA 92138

Newport News Shipbuilding
4101 Washington Avenue
Newport News, VA 23607

Norfolk Shipbuilding & Drydock
Corp.
Post Office Box 2100
Norfolk, VA 23501
Norfolk, VA (2 plants)
Berkeley, VA

Northwest Marine Iron Works
Post Office Box 3109
Portland, OR 07208

Pennsylvania Shipbuilding Company
P. O. Box 442
Chester, PA 19016

Peterson Builders, Inc.
101 Pennsylvania Street
P. O. Box 47
Sturgeon Bay, WI 54235-0047

Savannah Shipyard Co.
Post Office Box 787
Savannah, GA 31402

Southwest Marine, Inc.
Foot of Sampson Street
Post Office Box 13308
San Diego, CA 92113

Todd Shipyards Corp.
Todd Pacific Shipyards Corp.
One State Street Plaza
New York, NY 10004
Alameda, CA,
Brooklyn, NY, Galveston, TX
Houston, TX, Los Angeles, CA
New Orleans, LA, San Francisco, CA, Seattle, WA

Tracor Marine, Inc.
Post Office Box 13107
Port Everglades, FL 33316

## ALLIED INDUSTRIES MEMBERS

American-Standard
Industrial Products Group
Williamsville, NY

Bird-Johnson Co.
Walpole, MA

Borg-Warner Corp.
York Division
York, PA

Colt Industries, Inc.
Washington, DC

Combustion Engineering, Inc.
Windsor, CT

Eaton Corp.
Cutler-Hammer Products
Rockville, MD

General Electric Co.
Schenectady, NY

Hopeman Brothers, Inc.
Waynesboro, VA

Jamestown Metal Marine Sales, Inc.
Boca Raton, FL

Jered Brown Brothers, Inc.
Troy, MI

Lake Shore, Inc.
Iron Mountain, MI

MacGregor-Comarain, Inc.
Cranford, NJ

Raytheon Service Company
Arlington, VA

Sperry Corp.
Marine Systems
Great Neck, NY

Transamerica Delaval, Inc.
Trenton, NJ

Union Carbide Corporation
Danbury, CT

Ward Leonard Electric, Co., Inc.
Mount Vernon, NY

Western Gear Corp.
Lynwood, CA

Westinghouse Electric Corp.
Pittsburgh, PA

Worthington Pump Corp.
Harrison, NJ

NAVAL ARCHITECT MEMBERS

J. J. Henry Co., Inc.
New York, NY

John J. McMullen Associates, Inc.
New York, NY

ASSOCIATION MEMBERS

The American Waterways Operators, Inc.
Arlington, VA

New England Ship Repair Yard Assn.
East Boston, MA

New York and New Jersey Dry Dock Assn.
New York, NY

Western Shipbuilding Assn.
San Francisco, CA

AFFILIATE MEMBERS

Tomlinson Refrigeration & Supply Co.
Elizabeth, NJ

Standard Marine Services, Inc.
Bayonne, NJ

New York Protective Covering Industries, Inc.
Brooklyn, NY

C-O-Two Sales & Service
Hoboken, NJ

Ocean Electronics, Inc.
Brooklyn, NY

Terry Corporation
New London, CT

Hayward Industrial Products, Inc.
Elizabeth, NJ

Poten & Partners, Inc.
New York, NY

McNab, Inc.
Mount Vernon, NY

McLean Contracting Company
Baltimore, MD

Tidewater Construction Corporation
Norfolk, VA

Williams & Watts, Inc.
Fairfield, NJ

Seacoast Electric Supply Corp.
Rye, NY

ManTech International Corporation
Alexandria, VA

## STATEMENT OF WESLEY D. PAYNE, SENIOR VICE PRESIDENT, NORFOLK SHIPBUILDING & DRYDOCK CORP.

Mr. PAYNE. Yes, sir. I thought it was too brief this morning when I got here, but now I see the wisdom of this short preparation.

Mr. HAWKINS. Thank you.

Mr. PAYNE. Mr. Chairmam and members of the committee, I am Wesley D. Payne, senior vice president of production representing Norfolk Shipbuilding & Drydock Corp. and the Shipbuilders Council of America. The Shipbuilders Council of America represents the principal domestic shipbuilders, ship repairers, and suppliers of equipment and services to those industries. A copy of the council's membership list is attached to this statement and I respectfully request that that statement be included in the record.

Mr. HAWKINS. Without objection, it will be.

Mr. PAYNE. Thank you, sir.

For years the shipbuilding industry has provided significant training and development opportunities for the young people. We are looking for a way to develop special industrial skills.

Through the apprentice concept, many maritime companies with medium to large size work forces set up a formal program of training to insure the availability of skilled work forces in the future. The basic process is one of identifying potential apprentices through the application process. Usually an applicant would be a high school graduate with a background in math and possibly science. An applicant would also be expected to demonstrate certain mechanical and/or physical capabilities that would allow him or her to perform the arduous tasks often connected with ship repair and construction.

Shipyards have traditionally controlled both the academic and on-the-job training of the apprentice, with its own in-house staff of instructors. Although the public training agencies, the management of the shipyard, working with the union in some cases, maintained control of the operation. In practice about 80 percent of the apprentice's time is spent actually on the productive job. The other 20 percent is spent in academic or trade theory classes and labs, classes in mathematics, science, drafting, shipbuilding theory, safety, economics, marine engineering, are typical courses in the academic portions of the program.

Mr. HAWKINS. Gentlemen, we have about 5 minutes, and if you can try to summarize, unfortunately there is a vote pending in the House and we do have 5 minutes latitude.

I'm sorry, Mr. Payne. You may proceed.

Mr. PAYNE. Specific trade theory courses are taught consistent with the trade requirements. This will vary from 300 to 1,000 hours of study depending on the length of apprenticeship and difficulty of the trade. At the present time most shipyards connected apprenticeship ranges from 3 to 5 years.

Until the mid-sixties, most shipyard apprenticeship programs were filled almost exclusively with white male applicants between the ages of 18 and 25. At that time many companies opened their programs to minority males. It wasn't until early in the seventies that shipyard apprentice programs were opened to the female applicants. Today women and minorities compose a significant percentage of the shipyard work force. In fact, a higher percentage than most industries that are considered to be nontraditional for women and minorities.

For example, the first female to graduate from Norfolk shipbuilding apprentice program did so in 1976. In fact, only 51 females were hired as apprentices from 1972 to 1978, and only 8 graduated. In 1982 alone there were 34 females in training in all 3 years of our program. Ten graduated in 1982, more than the first 6 years combined.

Our results continue to indicate that selection practice and proper placement can assure greater success rates for females in the shipyard apprentice programs.

During the same period, 518 males were hired and 186 graduated. The retention of the males up to this point has been significantly better than female retention. Comparing white males to minority males, there is no discernible difference in their retention rate.

A recent assessment of the reasons that both males and females voluntarily quit apprenticeship training indicated that there is a real lack of understanding on the part of the apprentice concerning life of a shipyard mechanic. As a result, nearly one-third of the apprentices do not complete the first year.

In an effort to combat this problem Norshipco has and is encouraging prospective apprentices to come into the yard as trainees or helpers in order to determine what shipyard work is really like and decide if the work is suitable for them. Likewise, the shipyard has an opportunity to evaluate the suitability of the workers and apprentices. Over the past 3 years, those apprentices who were transferred from the general work force to the trainee positions, after 3 or more months in the yard, were twice as likely to still be in the apprentice program after their first year as those who came directly into the program from the outside.

Of course, the basis for any successful shipyard apprentice training program rests with two key elements.

The first is the basic work force consisting, among other things, of some genuine, first class mechanics. An apprentice cannot learn a trade unless he has an on-the-job teacher, the mechanic.

Second, and just as important, it is a necessity for someone to work on ships, to build or repair, without a reasonably constant workflow. Private industry is unable to maintain the apprentice program when it comes down to laying off a mechanic with 10 years' experience or a second year apprentice. The decision is quite clear.

During the fall of 1982 Norshipco had an apprentice program with 350 apprentices. Today, sir, we have 28. We are in better shape than virtually any other private yard on the east coast in specialized repair. The long-term impact of this drastic reduction in apprentices is mind boggling when you consider that our graduating class of 1985 will be 15 in lieu of 125.

This not only impacts on the quality of our overall work force but is indicative of the loss of skilled shipyard trades which are dying for the lack of use by commercial and government agencies. Without a viable apprentice system in the marine industry, the skills for building and repairing ships will continue to erode.

Building or repairing a ship is said to be one of the most difficult tasks performed in our country today. During the past 10 years many of the skilled shipbuilders in this country have lost their jobs and, thus, their skills. The impact of this decline in skilled shipbuilders has become increasingly more evident in shipyards around the country who seek skilled craftsmen to work in the shipbuilding industry.

The simple fact is that many of the skills have and are being lost, and without a comprehensive apprentice program system for all sizes of shipyards, the industry will not be able to meet the needs of our Nation. There is no way to give a new shipyard employee 10 years experience in 2 or 3 years. The skills are just too complex.

Given the present situation of the industry and the projected demands for the repair and rebuilding of both our merchant marine and Navy, it is imperative that a strong, industrywide program to develop skilled shipyard workers be supported and encouraged. I now conclude my remarks.

Mr. HAWKINS. Thank you, Mr. Payne. It's very well timed. The committee must adjourn. We will keep the record open for any additional statements that will be presented to the committee. I did have a set of questions that we would have asked. However, I will submit them to you, Mr. Burnsky, and to you, Mr. Payne, and you may allocate them out as you see fit, and I assume Mr. Erlenborn has some. We will add his questions as well. We would appreciate your answers. We will keep the record open waiting for that.

Mr. BURNSKY. Very good. Will do.

Mr. HAWKINS. We certainly appreciate the testimony. We regret that time has run out on us.

Mr. BURNSKY. And, Mr. Chairman, I would like to have you deeply consider our suggestion about a commission. I think a commission would be the proper vehicle by putting all these divergent views together, to recommend to Congress as to what we should do about improving the apprenticeship program for these United States.

Mr. HAWKINS. Well, if you would submit details of that idea to the committee, I will see that that is distributed and given consideration.

Mr. BURNSKY. Thank you.

Mr. HAWKINS. Thank you. That concludes this series of hearings. I thank you all for coming.

[Whereupon, at 1:28 p.m., November 17, 1983, the subcommittee recessed, subject to the call of the Chair.]

[Material submitted for the record follows:]

### PREPARED STATEMENT OF WILLIAM M. ROSS, WILLIAM M. ROSS AND ASSOCIATES, INC.

As a brief introduction, I am William M. Ross, president of William M. Ross and Associates, Inc., a management consulting firm based in New York City. Prior to starting my firm, I was involved in public sector training, education and employment programs for over thirty years. The majority of my experience has been in assisting disadvantaged groups such as minorities, women, veterans and youth in moving into the mainstream of economic survival. The groups and organizations that I have worked with over the past thirty years list as a Who's Who of the local, state and national scene regarding viable employment, training and education for this country's poor and disadvantaged populations. Until recently, I directed RTP, Inc., the New York-based community-based organization which operated a nationwide network dedicated to the involvement of the population groups in the primary labor market, with a high priority on apprenticeship training opportunities. In my present position I am continuing the initiative of promoting employment, training and educational advancement for those disenfranchised populations.

It is apparent to the majority of this country's work force that we are experiencing one of the most fundamental changes our job market has endured in over forty years. The nature of work and the complexion of skills and occupations in the employment market continue to change significantly, displacing millions of today's workers while opening other employment opportunities. Unfortunately, a great number of these "new" jobs cannot be adequately addressed with the present workforce. Thus, we in the employment and training arena find two critical mandates: the effective retraining of displaced workers and the immediate production of newly trained workers; both being essential to this country's economic stability and progress. The predominant characteristic of today's job market is the increase of technology in every industry. We are sure to see new industries develop out of strong technological origins from the past thirty to forty years. In kind, we will experience a retooling of our older industries through technological improvement.

The question then is how to go about the preparation of the present and future workforces. Simply stated, we must address the need for effective, meaningful, career-oriented training, coupled with essential, related education. While there are many means of achieving employment-related training, I can think of no other formula that assures long-term benefits for both the employer and the worker and forestalls the possibility of job and skills obsolesence.

Having witnessed the spectrum of training systems in most industries and parts of this country, I can speak to the relativity of training, as it meets particular needs and situations. As I previously stated, only when quality training is combined with pertinent education will the employer, the worker and the industry realize maximum benefits. For this reason I can advocate the apprenticeship training system as a comprehensive, wholly plausible alternative to many of our skills shortage problems. It is unfortunate that the federal government's interest has dwindled to the degree that is evident today, particularly within the Department of Labor. National emphasis on training, as reflected in the recently enacted Jobs Training Partnership Act, lends no credence, nor benefit of direct reference to apprenticeship training. The current decimation of the Department of Labor's apprenticeship-related offices and bureaus, data collection systems and committee and program initiatives has essentially gutted the National Apprenticeship Program of it's central focus and operating network. There is undoubtedly a need for such a national emphasis, which can address industry-wide apprenticeship issues more effectively than if left to a multitude of local and/or state interpretations and implementations. A national apprenticeship training agenda can draw upon vast resources, due to it's national approach, versus more localized, isolated resource potentials. To the high degree that minorities, women and other socio-economically disadvantaged groups have benefited from a federal interest in apprenticeship over the last sixteen years (up until this fiscal year), it seems reasonable to say that we can expect a severe decline in their participation. Figures from the Department of Labor's Bureau of Apprenticeship Training reflect a twenty-two percent decline in registered apprenticeships from fiscal year 1979 through October, 1983. Much of this is due to a decline in construction-related apprenticeship opportunities. But we cannot ignore the reduction and elimination of federally-supported advocacy and service systems, such as the Targeted Outreach programs and the Bureau of Apprenticeship Training field operations when it comes to assessing why registrations among minorities and women have fallen.

We should assess the National Apprenticeship Program in present day context, with an eye toward its future role. But to say that it has a questionable role or to handicap it further will be to deny its capabilities and successes and to eliminate the possibility of objective, necessary investigation into its current and future usefulness.

I would like to leave you with these few recommendations, offered with a determined interest in the continued high level federal involvement in the promotion of apprenticeship training as one viable alternative to our nation's employment and training dilemmas.

Recognize apprenticeship training as a highly innovative, flexible system that can be applied in a multitude of occupations and industries well beyond traditional construction and manufacturing industry applications.

Amend J.T.P.A. to reflect support in the use of apprenticeship training as an advocated system for employment training.

Assess the National Apprenticeship Program's goals, objectives and operations with regard to present and future national employment and training issues, in order to keep the Program contemporary and vital.

Establish an initiative in the promotion of the new apprenticeship occupations and the development of the related training systems.

Re-emphasize the Program's commitment toward involvement of minorities, women, youth and other socio-economically disadvantaged populations, for whom apprenticeship training provides more than employment and skills training but the opportunities for self-sufficiency and economic independence.

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INLAND STEEL CO.,
INDIANA HARBOR WORKS,
*East Chicago, Ind., November 9, 1983.*

Attention: Mr. Thomas F. Royals, Liaison Officer.

Hon. JOHN N. ERLENBORN,
*Committee on Education and Labor, U.S. House of Representatives,*
*Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: Inland Steel Company established its first apprentice training programs in 1936 in order to meet its need to maintain an adequate workforce of skilled craftsmen. We now have apprentice training programs in 19 different crafts and currently have some 700 apprentices in training (down from 1800 two years ago). Therefore, we are very interested in providing some input into the topics to be considered in the upcoming oversight hearings of the Subcommittee for Employment Opportunities.

When the general public thinks of apprenticeship training in the United States, the average layman, including most Vocational Education people and high school counselors, think in terms of the Building Trades. It must be pointed out that there are large numbers of apprentices in the industrial trades as well with both union and non-union involvement. The private sector should have a high priority in future employment and training activities.

The JTPA recognizes the need for increased cooperation between business, labor, education and government. Likewise, the need for such cooperation should be developed in any future regulation of apprentice training programs. For example, at Inland we have apprentices attending related education institutions in both Indiana and Illinois and although our Indiana Harbor Works is located in Indiana, we are also a member of the Manufacturers Association of Chicago Heights, Illinois and are vitally interested in those developments affecting apprenticeship in both states.

Recognizing the fact that there had been shortcomings in direction of leadership from the Department of Labor in the past, I still feel that central control would be preferable to allowing the individual States and territories to govern their own programs. Strong direction at the Federal level is necessary to maintain uniformity in the regulation of apprentice training.

At first blush, it would seem that given the proper restructuring, the Bureau of Apprenticeship and Training (whose organization is already in place) could be upgraded to meet the needs of apprenticeship in the 1980's and 1990's. A crucial element in such restructuring should be the establishment of a joint task force of business, labor and education, with the power to recommend those standards which will be necessary to provide workable programs to cope with the ever-increasing demands of changing technology.

Certainly if such restructuring is not possible, then the establishment of a National Apprentice Council would be a viable solution to the problem.

Attached, please find my responses to some of the questions and issues on apprenticeship which I understand will be on the agenda for the oversight hearings scheduled to be conducted on November 15 and 17, 1983. If I may be of further assistance in your deliberation, please contact me at (219) 392-5660.

Sincerely,

JOHN T. TRENT,
*General Supervisor, Apprentice Training.*

### QUESTIONS AND ISSUES ON APPRENTICESHIP FOR OVERSIGHT HEARINGS

1. What broad policy considerations may impact your attempts to strengthen apprenticeship policy?

A definitive policy statement should be generated by the government outlining its support for apprentice training. Minimum standards should be established for the various types of programs. A better approach regarding the dissemination of information regarding apprentice opportunities and training requirements is needed. All apprentice programs with the number of participants in each should be listed with the Federal Government for inventory purposes to help determine the magnitude of involvement.

2. What complaints, problems, and recommendations have been voiced concerning current apprenticeship programs and policies?

The most glaring problem with which we have been faced is the appalling lack of basic education of apprentice applicants. The majority of applicants who attempt to enter apprentice programs cannot meet the minimum standards in basic mathematics and reading comprehension to be able to cope with the related education requirements of the apprentice programs. The deficiency stems from inadequate fundamental education at both the elementary and secondary education levels.

3. What steps might be involved in efforts to insure, more effectively, that apprenticeship training is relevant to the skill requirements of the 1980's? To make sure that manpower availability and skill requirements are meshed?

An effective means of attacking this problem is with the task force approach. A task force composed of members of business, industry, labor and education should be formed to (1) determine the skilled labor workforce requirements, both at present in the area involved as well as forecasting those requirements for the next several years; (2) determine the availability of manpower to fill those needs; (3) determine the training requirements necessary to develop the required skills both at the secondary and post-secondary levels of education; and (4) develop task analysis and job analysis to develop the curriculum requirements to meet those needs.

Such task forces can effectively be administered in cooperation with local Work Education Councils, Private Industry Councils or Trade Associations. The BAT could also be a catalyst for development of such task forces.

4. The future of apprenticeship in the 1990's—compare the United States program with Europe and Japan.

I am not familiar with the program in Japan, however, I do know that in Australia and Great Britain the programs are much more structured and closely monitored by the government. Most programs are much more task oriented than in the United States.

5. Are there any general actions which might be recommended so that policy makers might have a better understanding of apprenticeship and its role, broadly, in manpower training?

One appropriate action would be to solicit more input from a broad base of people involved in apprenticeship. Oversight hearings such as planned is a good approach. A National Apprenticeship Council and/or the establishment of subcommittees to review the various problems associated with apprenticeship and make recommendations to Congress would certainly be very helpful.

6. The need for new standards and techniques in training and instructions; wages and preapprenticeship.

a. Training and Instruction—as stated before, there is a very definite need for upgrading training standards and techniques. For example, the old method of learning on-the-job by means of osmosis is no longer adequate to meet the advances in technology in most industrial programs. Performance-based training must be implemented to assure that the apprentice is, in fact, capable of performing the tasks required of his craft. In conjunction with this, related instruction must constantly be upgraded to meet the challanges of the future.

b. Wages—the area of compensation is generally governed by individual bargaining agreements. Government should probably only regulate to the extent that a fair minumum wage is maintained and a proper relationship between the ratio of wages paid to apprentices as compared to those of the Journeyman be provided.

c. Pre-apprenticeship—such programs to be meaningful and cost-effective should be primarily be geared to determining a person's aptitude for apprenticeship. An assessment should be made of one's ability to absorb the required training and in most cases, a program of remedial training would be helpful to upgrade the educational level of the potential trainee.

7. What is meant by a shortage of skilled workers? Is there one now? Will there be a shortage in the next ten years?

In the present depressed state of the economy, one would not think that there is any overall shortage of skilled workers. However, as the nature of business changes as expected in the future from an industrialized economy to one which is more science oriented and more highly specialized, I would expect to see many pockets of shortages in certain fields. For example, as robotics and other related high-technology fields become more prevalent, the need for craftsmen skilled in electronics and instrumentation will be generated. Word processing and computer related businesses are rapidly accelerating the need for highly trained science technicians.

8. Is there a need for government training programs in apprenticeship? Has the Job Corps program been successful?

Although there is an increasing need for funding assistance and developmental help for apprentice programs in construction and in the private sector, a need for a fully subsidized or government managed type of apprenticeship program probably does not exist.

One great need which has technically been ignored and one in which government both on the State and Federal level should provide direction and financial support is in the area of city, town, county and state services. Most of these traditional branches of government operate with a great deficiency in skills. Almost all of the crafts which are apprenticeable in the private sector are required to operate and maintain local government entities but formalized training for the thousands of people in these positions is practically non-existent.

Other than in the Police and Fire Service where training is provided, it would be most cost-effective to establish government sponsored apprenticeship training programs for such craft-related positions as Maintenance Mechanic, Welder, Heavy Equipment Operator, Stationary Engineer, Electrician, Water Treatment Operator, etc.

With respect to the Jobs Corps program, I would have to say that, at least in my experience in industry, it has not been successful for many reasons. I will not elaborate at this time.

9. Should government agencies be required to conduct and register apprenticeship programs? In defense and civilian agencies?

Other than as outlined in my answer to (8) above, I do not feel that government agencies should be required to "conduct" apprenticeship programs. I feel that some of the former restrictions to registration of apprenticeship programs should be modified so that more programs could be registered, monitored and inventoried. Certainly more stringent guidelines could be applied in defense agencies.

10. The role of the government in the present program? Is there too much red tape?

The present program should be reviewed and standarized to be more effective. For example, the present staffing levels are not sufficient to provide the coverage needed.

11. The role of women in apprenticeship: Types of jobs and types of barriers.

a. Types of Jobs.—Speaking from experience in industrial apprenticeship training, I have found that generally women have tended to gravitate toward the less physically demanding jobs and have been most successful where dexterity and mental challenge was required. We have women apprentices who have progressed quite well in such fields as Electrician, Welder, Machinists, Mechanic, etc.

b. Types of Barriers.—Generally, as mentioned, the physical limitations of the job influence the selection of a particular program. Women tend not to be interested in occupations where heavy lifting, climbing or a perceived exposure to heat and safety hazards exist. Another factor which we have found in our operation is that the potential for satisfactory earnings exist in most of the labor or production sequences so that they are not necessarily attracted to apprenticeships solely to earn more money.

12. How does an older worker or a displaced worker obtain Journeyman status?

In our situation, there has been little restriction on the older worker to obtain Journeyman status. There is no upper age limit in our programs as in many others.

A displaced worker has a more difficult situation in industry. Most openings are governed by plant seniority which is not in his favor. We have been attempting to find relief for these individuals through the JTPA.

13. The effects of alien certification on the apprenticeship program.

I have had no experience in this area.

14. Should the apprenticeship program be turned over to the individual States to be operated by them?

I answered this question in my opening remarks.

15. How can apprenticeship registration procedures be improved and demand occupations be addressed?

If the requirement for joint management-union committee administration were eliminated, virtually all apprenticeship programs would be eligible for registration. The joint committee structure primarily exists in the Building Trades and with such unionized industries as automotive, for example, thus eliminating many industries and service organizations from participation. Certain basic standards with respect to on-the-job training and related education hours could be established which would guarantee compliance with apprenticeship guidelines.

16. Financial Incentive: Tax deduction, full or partial; and tax credit or exemptions.

Any form of tax relief would positively influence the advancement of apprenticeship training. Because a large part of most apprentice programs is nonproductive, there is a built-in constraint for most employees to add apprentices in appropriate numbers to meet expected attrition in the skilled occupations. Tax relief would ease this burden. The availability of funding sources such as grants for on-the-job training, equipment, tuition costs or classroom equipment would also be of great value.

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CHRYSLER INSTITUTE,
CHRYSLER CORP.,
*August 18, 1983.*

Hon. JOHN N. ERLENBORN,
*Ranking Republican Member, Committee on Education and Labor,*
*House of Representatives, Rayburn House Office Building, Washington, D.C.*

SIR: It is gratifying to hear that some members of Congress are interested in the future of the skilled workforce of our Nation; and the problems involved in training their replacements, as indicated in your letter to Congressman Hawkins, in which you stated many of the problems as well as issues and questions that should be addressed by the Subcommittee later this year.

I would like to compliment you and the members of your staff on doing your homework on the problem. The points raised in your communication to Congressman Hawkins for discussion are areas that must be addressed and hopefully resolved in a manner that will provide incentive to cause the private sector to increase apprentice training throughout the country.

It is imperative that the Federal Bureau of Apprenticeship and Training be retained and strengthened. Fragmenting the system to the States will only create more obstacles in the system resulting in a greater resistance by both management and labor to utilize the apprenticeship system.

More emphasis must be placed on reducing the bureacratic red tape instead of increasing the number of agencies that program sponsors must deal with in attempting to conduct an apprentice program.

Many program sponsors operate in many States and if it should become necessary to deal with individual State agencies I'm sure that more sponsors would discontinue apprentice training.

The cost of apprentice training has increased drastically over the last decade not just because of the training required to learn the trade, but we have found it necessary to conduct pre-apprentice and remedial training programs in order to assist our applicants to qualify. This is an additional expense that would not be part of apprentice training if our school systems were providing quality education in "K" through twelve.

In conjunction with the above comments I am enclosing a copy of my response to your questions and issues that were solicited by A.S.T.D.

Hopefully, the enclosed will be of assistance in your discussions with members of the Committee.

As you can determine I am very much interested in apprenticeship, its future and anything that I can do to preserve and improve the apprenticeship system.

Sincerely,

W. L. MAIN,
*Manager, Skilled Trades Training.*

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CHRYSLER INSTITUTE,
CHRYSLER CORP.,
*August 8, 1983.*

Mr. ROBERT L. CRAIG,
*Vice President, Government and Public Affairs,*
*American Society for Training & Development, Inc., Washington, D.C.*

DEAR MR. CRAIG: In response to your recent letter soliciting informational material to be presented to members of the Sub-Committee on Employment Opportunities for their discussions to be conducted later this year, I would like to present the following points for consideration on the specific questions and issues offered by Congressman Erlenborn:

*Question No. 1.* What broad policy considerations may impact upon attempts to strengthen apprenticeship policy?

Response. Strengthen the Federal Bureau of Apprenticeship and Training and deemphasize State Apprenticeship Councils. Many employers and International Unions operate in many states. By registering with the Federal Bureau it precludes multiple registration, cuts down on paperwork requirements for each state as well as duplicate program reviews.

*Question No. 2.* What complaints, problems, and recommendations have been voiced concerning current apprenticeship programs and policies?

Response. Over Regulation. (a) Dual EEO Reviews and Enforcement.

(b) Too much emphasis placed on quotas in preference to qualifications.

(c) Too many regulations imposed by individual states i.e., SAC's—California, Wisconsin, New York and Minnesota.

*Question No. 3.* What steps might be involved in efforts to insure, more effectively, that apprenticeship training is relevant to the skill requirements of the 1980s? To make sure that manpower availability and skill requirements are meshed?

Response. (a) Federal financial assistance to Joint Consortiums made up of representatives from Community Colleges, Industry and Unions to develop updated curriculums for related training.

(b) Federal financial assistance directed toward more vocational and technical education for non-college bound students.

(c) Somehow influence improvement in basic education K through 12.

(d) Influence the utilization of qualified counsellors to assist students who wish to prepare for a career in the skilled trades in preference to going on to college.

*Question No. 4.* The future of apprenticeship in the 1990s—compare the U.S. program with Europe and Japan.

Response. Apprenticeship has been on the decline in the late 70's and early 80's and because of this there will be an upsurge as the economy strengthens. Many skilled people will be of retirement age within ten years. The European system is very good and many aspects of it should be adopted in this country. Japan does not have an apprentice program as we know it in this country.

*Question No. 5.* Are there any general actions which might be recommended so that policy makers might have a better understanding of apprenticeship and its role, braodly, in manpower training?

Response. Invite Joint Committees to meet with policy makers to discuss and demonstrate what an apprenticeship program consists of i.e., selection requirements, related training levels required for completion and the type of on-the-job requirements to successfully complete the program. Also, the earning potential of a qualified skilled trades person.

*Question No. 6.* The need for new standards and techniques in training and instruction, wages, and pre-apprenticeship.

Response. (a) Updated standardized curriculum for related instruction at the Community College or Vocational Technical College.

(b) There is a need for developers and instructors for delivery of related training for remote areas with insufficient educational facilities to conduct classes.

(c) The Development and Delivery of Pre-apprentice Training—invariably this will consist of math and reading skills that should have been acquired in "K" through twelve education.

*Question No. 7.* What is meant by a shortage of skilled workers? Is there one now? Will there be a shortage in the next ten years?

Response. With the rapid change in technology and the trend to emulate the Japanese and other industrial countries we are finding our skilled employees require constant upgrading to keep up with the state of the art and in many cases the worker prefers not to go back to school or is incapable of assimilating the training required to keep up with the state of the art for his trade. Further, with the slowdown of training during the past decade we will experience a definite shortage within the very near future.

*Question No. 8.* Is there a need for government training programs in apprenticeship? Has the Job Corps program been successful?

Response. (a) Yes in all branches of the military.

(b) Yes other government agencies that will continue to employ them as journey persons.

(c) Personally the Job Corps has not been successful. It has cost too much per person for the little return potential.

*Question No. 9.* Should government agencies be required to conduct and register apprenticeship programs? In defense and civilian agencies?

Response. (a) All branches of the military should register and conduct apprentice training. The individual and the taxpayer both benefit from these programs.

(b) All government contracts to private industry for defense or construction should have a mandatory apprentice program included.

(c) All government run agencies such as: Veteran's Hospitals, Sub-Depots or agencies that utilize journey persons should be required to conduct apprentice training.

*Question No. 10.* The role of the government in the present program? Is there too much red tape?

Response. Yes, there are too many reports, too many reviews especially in the areas of EEO and Veterans' Benefits, especially in states with State Apprenticeship Councils.

*Question No. 11.* The role of women in apprenticeship: Types of jobs and types of barriers.

Response. Equal opportunity for all. All candidates must meet the qualification standards established to enter the program and be able to perform all work assignments of the trade. No company or union can affort to employ individuals that must be given favoring assignments.

*Question No. 12.* How does an older worker or a displaced worker obtain Journeyman status?

Response. Some industries and some trade unions permit the issuance of Journeyman Status from specified numbers of years working on the trade. Older workers in most industries have the same opportunity as the young worker. Most older workers do not want to go back to school to meet the requirements of the trade. In the auto industry the apprentice must earn two-thirds of an associate degree just completing the basic related training requirements for the trade. This requirement often discourages the older worker because they do not wish to return to school.

*Question No. 13.* The effects of alien certification on the apprenticeship program.

Response. No comment or experience with this situation.

*Question No. 14.* Should the apprenticeship program be turned over to the individual states to be operated by them?

Response. The program as operated at the federal level is the most desirable, especially if tax exceptions or tax credits are considered. Also, as commented on before, many organizations operate apprentice programs on a national basis and it is preferable to operate with one government agency instead of many individual state agencies.

*Question No. 15.* How can apprenticeship registration procedures be improved and demand occupations be addressed?

Response. (a) Registration with one agency.

(b) Offer assistance to candidates as to where apprenticeships are available nationally.

(c) Offer assistance as to how to obtain Preapprenticeship training prior to making application.

*Question No. 16.* Financial incentive: Tax deduction, full or partial, and tax credit or exemptions.

Response. (a) Tax credit for total cost of training an apprentice.

(b) Also, establish a quota for apprentices to be trained by an organization and then pay an incentive for the number trained in excess of the quota established.

Hopefully, the responses to the issues raised by Congressman Erlenborn will be of assistance in your future discussions with members of the Committe.

As you can determine from my responses I am very much interested in apprenticeship, its future and anything that I can do to preserve and improve the apprenticeship system.

Sincerely,

W. L. Main,
*Manager, Skilled Trades Training.*

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Associated Builders & Contractors, Inc.,
*Washington, D.C., October 14, 1983.*

Hon. Jim Jeffords,
*Ranking Minority Member, Subcommittee on Employment Opportunities,*
*House of Representatives, Rayburn Building, Washington, D.C.*

Dear Congressman Jeffords: I would like to take this opportunity to formally request that the Associated Builders and Contractors be included on the witness list for the Subcommittee's National Apprenticeship Act oversight hearings scheduled for November 9-10, 1983. ABC believes that the hearings will provide valuable insight into the types of adjustments which should be made in the Apprenticeship Act to facilitate the training and retraining of our unemployed and underemployed, as well as the new entrants to the workforce.

ABC is the fastest growing national construction trade association, currently representing over 16,000 member firms in 77 local chapters throughout the United States. ABC members share a common philosophy calling for contract award to the lowest bidder. At present, the open shop construction industry accounts for 60 percent of all new construction.

Although open shop construction has grown dramatically as a percentage of overall building volume, our segment of the construction industry has, until 1980, been training only a minute portion of the skilled construction workers we demanded. In 1980, the Associated Builders and Contractors created the Wheels of Learning program, a private competency-based, task-oriented training program. When combined with on-the-job training and classroom instruction, the curriculum provided by the Wheels program allows an individual to complete the equivalent of a four-year apprenticeship program in 27 to 36 months. Moreover, Wheels has given the open shop construction industry the tools necessary to train tomorrow's employees.

Although more than 2,000 apprentices are currently using the Wheels of Learning curriculum, future projections for open shop construction labor demands show that by 1990, the construction industry will create a need for more than one million additional employees. ABC would like to join in the oversight hearings to elaborate on the potential role of the private sector in providing alternatives to federally financed apprenticeship programs and, more specifically, to focus on the continued demand for a steady stream of skilled craftsmen to work on both union and nonunion projects.

In addition to acquainting members of the Subcommittee with the Wheels of Learning program and the type of apprenticeship and training program which the private sector can and should continue to provide, representatives from ABC would also like to comment on current strengths and weaknesses of the Bureau of Apprenticeship and Training activities and the potential costs associated with decentralization. ABC would also like to discuss the advantages of moving toward BAT approval of competency-based training programs and on the need to establish a national certification program to allow skilled construction workers to follow the demand for labor without the fear of having their credentials questioned.

We apologize for the brevity of our initial comments and for the late date of our response. Unfortunately we were not made aware of the hearings until last week. We are in the process of preparing additional comments prior to drafting testimony and would welcome any specific questions you might have. Enclosed for your information is some additional information on the Wheels of Learning program. Please feel free to contact me or Meredith Bennett, Assistant Director of Government Relations, for further details.

Sincerely,

JAMES P. SCHLICHT,
*Director, Government Relations.*

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GOVERNMENT OF THE VIRGIN ISLANDS,
DEPARTMENT OF LABOR,
*Christiansted, St. Croix, V.I., August 30, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor,*
*House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: In response to your letter of August 18, the following comments are submittes:

### THE APPRENTICESHIP SYSTEM

The Apprenticeship System is an organized training plan through which individuals acquire trade and technical skills and knowledge. Training involves daily on the job training in the manipulative procedures with periodic instruction in the technical aspects related to the work requirements. The training provided for learning all required practical and technical skills for the particular occupation. Theoretical subjects are mastered during related instruction classes, which are conducted during the evening hours, and continue throughout the Apprenticeship term. This arrangement, hands on training in the practical operations of a skilled trade and related instruction classes, provides a standard part of typical Apprenticeship Agreements.

Under the V.I. Apprenticeship Law, registration is required and there are stipulated requirements concerning time of training, gradually increasing pay and performance reports. Apprenticeship terms of run from one to three years, depending on the skills to be acquired and the basic educational level of the Apprentice. Wage rates begin at least 60 percent of the Craftworker's wage and increases progressively, as the apprentice becomes more competent in his chosen field. One year's credit is given for successful completion of vocational high school—three years in a particular trade, and the total apprenticeship term is correspondingly reduced. Registrants without this basic background are required to serve full apprenticeship terms.

Near the end of apprenticeship term the pay rate is approximately 90 to 95 percent of the Craftworker's rate of pay. The system also requires written agreements, signed by the apprentice (and his parent if the apprentice is under 18 years of age), the employer, or training director and a union official if the employer's business or shop has a bargaining agreement. On the reverse side of the agreement, there are provisions for related instruction, wage schedules, and a training outline or schedule of work experiences for the trade or technical field involved.

Most apprenticeship agreements are non-joint, since only the larger employers in the Virgin Islands are subjected to bargaining agreements—Union Contracts.

## SUGGESTED FEDERAL POLICY

The Bureau of Apprenticeship and Training of the U.S. Department of Labor should continue its oversight responsibilities of National Programs, expand its role in developing new apprenticeable occupations in high-technical fields and para-professional health occupations, as well as other areas, which are not presently considered apprenticeable.

The Bureau should also provide technical assistance, guidelines and an adequate National Apprenticeship Reporting System, for the collection and dissemination of statistics on apprenticeship registration, completions and future trends.

Additionally, BAT should:

1. Foster and encourage the establishment of State Apprenticeship Agenices and Councils, where no such State Agencies and Councils presently exist.
2. Reduce the number of BAT staff personnel in SAC States, in order to reduce jurisdicitional conflicts, and enhance the productivity of State Apprenticeship Agencies.
3. Provide financial assistance to State Agencies for staff expansion, training and the promotion of Apprenticeship Programs.
4. Promote coordination and cooperation between BAT, SAC's, Vocational Education (U.S. Department of Education) State Technical Institutions, Junior and Community Colleges.
5. Facilitate participation of State Apprenticeship Agencies in the State and local administration of training programs for Korean conflict and Vietnam era Veterans of the U.S. Armed Forces—Public Law 98-77; as well as the on-the-job training provisions of the new Job Training Partnership Act—Public Law 97-300.

On-the-job training programs have been effectively used in the Virgin Islands for pre-apprenticeship and as an entrance level program into full-time registered Apprenticeship, in fields designated as Apprenticeable on the National and local levels.

6. Invite the assistance of Industry, Labor Organizations and Education, in the development and design of related instruction courses, which are relevant to the needs of State and local employment requirements.

Finally, may I suggest that Donald J. Grabowski, President of the National Association of State and Territorial Apprenticeship Directors (NASTAD) and/or Robert S. Baumgardner, Secretary, be specifically invited to give oral testimony at your hearings on the National Apprenticeship Program, scheduled for this autumn. Both these gentlemen are knowledgeable and experienced on the Apprenticeship System.

Don Grabowski's address is: Bureau of Employability Development, N.Y. State Department of Labor, State Campus, Building 12, Room 428, Albany, New York 12240 Tel: (518) 457-6820.

Bob Baumgardner's address is: Director, Division of Apprenticeship and Training, Department of Labor, P.O. Box 12064, Richmond, VA 23241 Tel: (804) 786-2381.

Sincerely,

**Alva C. McFarlane,**
*Director, Apprenticeship and Training.*

GOVERNMENT OF THE VIRGIN ISLANDS,
DEPARTMENT OF LABOR,
*Christiansted, St. Croix, V.I., September 12, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor,*
*House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: Thank you for your letter of August 29th, and your request for my written comments on the status of apprenticeship and its future.

The Director of our Division of Apprenticeship and Training, Mr. Alva C. McFarlane, has already responded to a smilar request. His comments, suggestions and recommendations, in my opinion are adequate and reasonable.

There are, however, a few observations, relative to the future of the apprenticeship system, which I would like to share with you.

(A) The U.S. Virgin Islands are a relatively small community with a rapidly expanding population, limited financial resources and a few large industries. Despite this, hundreds of our young men and women have made significant strides in recent years, through the Apprenticeship System.

(B) The larger industries have participated in apprenticeship training, in cooperation with the vocational-technical divisions of our high schools. They have also conducted related instruction classes in specific skill areas, at their own expense.

(C) The Division of Apprenticeship and Training administers (under an agreement with JTPA) on-the-job training programs, and utilizes OJT as an entry level program into apprenticeship, in apprenticeable occupations.

(D) CETA (now JTPA) funds have also been used to augment the cost of "Skill Centers" which functions as a related instruction facility for disadvantaged registered participants; almost all of whom have had no previous skill training and/or very minimum academic levels.

(E) Many small businesses could be encouraged to participate in apprenticeship; but are reluctant because there is no financial incentive to them, if applicants referred are ineligible for JTPA programs. The Targeted Jobs Tax Credit Program might be of some assistance. Here again, there are eligibility criteria for participants trainees or apprentices in TJTC.

### RECOMMENDATION

Apprenticeship Training is designed for the development of highly skilled craftsmen and women, to meet the demands of business and industry. In addition to "hands-on" training in the manipulative skills, of a trade related technical instruction is of great importance. In small communities, greater utilization of existing vocational-technical school facilities might be possible; if Federal funds are made available to expand night classes for registered apprentices, so as to defray the cost of instructors training material and supplies. These funds should be made available to vocational-technical education and specifically earmarked for this purpose.

Sincerely,

RICHARD M. UPSON,
*Commissioner of Labor.*

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BUREAU OF LABOR AND INDUSTRIES,
*November 29, 1983.*

Hon. JOHN ERLENBORN,
*Committee on Education and Labor, U.S. House of Representatives,*
*Rayburn House Office Building, Washington, D.C.*

DEAR REPRESENTATIVE ERLENBORN: The State of Oregon formally began Apprenticeship Programs in 1931, six years before any national program was developed. In fact, much of the national program was based on the Oregon experience. The need for a skilled labor force is perhaps even greater today. The Bureau of Labor and Industries' Apprenticeship and Training Division is responding to that need. Our policy decisions are guided by our mandate under ORS 660, which states.

"To encourage the preparation of persons with skills that will enable them to find gainful employment in an everchanging society and insure the continued growth and development of the economy of Oregon by contributing to the maintenance of an adequate supply of skilled workers."

The significance of this policy is of increased importance today. Our agency is now taking an aggressive, pro-active stance because we see Apprenticeship and Training Programs as being part of the solution to Oregon's economic problems. The link between apprenticeship and economic development needs to be understood and appropriate action taken. The Bureau of Labor and Industries is endeavoring to educate business, industry, employee groups and governmental decision makers as to the benefits of apprenticeship and training programs. We need to continue developing a supply of workers whose skills match industries' needs. We believe the Bureau of Labor and Industries has developed the first comprehensive marketing plan in the nation for apprenticeship and training. Our focus in the plan will be on the following:

1. Increasing overall participation in Apprenticeship and Training Programs through the diversification of the type of trades and occupations utilizing the apprenticeship system of training.

2. Providing cost-effective training programs through increased cooperation with agencies and organizations which contribute to Oregon's economic growth.

3. Increasing potential awareness and understanding of apprenticeship and training programs and services available through our agency.

In order to facilitate this process, the Bureau is networking with employer group, vocational education professionals, the State Board of Education, community colleges, labor unions and other relevant organizations and groups.

We are also concerned with the development of a strong Federal-State cooperative relationship. The State of Oregon needs support frcm the Department of Labor in several areas: research, technical assistance, and direct funding. Any funding received would be targeted for promotion activities which focus on non-traditional industries (high-tech, health care, and service industries).

Such support in the past has proven very beneficial. For example, during the time that our agency was receiving funds from the Department of Labor dedicated to increasing the participation of women and minorities of Apprenticeship and Training programs, there was a significant increase in their enrollment. The percentage of women enrolled in apprenticeship programs increased from 2.5 percent in 1979 to over 7 percent in 1982. However, since these funds became unavailable to us, we have been unable to make any further gains in these vital areas. It is also necessary to place more emphasis on Pre-Apprenticeship programs as well as a greater committment of JTPA funds for these types of programs.

These are some of the many concerns that we are addressing at the present time. We would be glad to supply you with more detailed information or to act as a resource for your committee at some future date.

Sincerely,

MARY ROBERTS,
*Commissioner.*

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JAMES P. MITCHELL,
*Pasadena, Md., November 11, 1983.*

Attn: Mr. Tom Royals.

Hon. JOHN N. ERLENBORN,
*House Employment Opportunities Subcommittee,*
*Rayburn House Office Building, Washington, D.C.*

DEAR CONGRESSMAN ERLENBORN: Enclosed is a copy of my statement respectfully submitted for inclusion in the record of the Apprenticeship Hearings.

Respectfully,

JAMES P. MITCHELL.

## STATEMENT OF JAMES P. MITCHELL

### APPRENTICESHIP HEARINGS

In any review of the status of apprenticeship in this country there are two important preliminary considerations:

1. While the two are not inimical, there is a distinction, often ignored, between the administration of public policy in apprenticeship and the administration of an apprenticeship program. Except for those instances where it is the employer and sponsor, governments neither Federal nor State do not "run" apprenticeships. The Federal Bureau of Apprenticeship and Training (BAT) does not conduct training for any apprentice. It, like its counterpart agencies at the State level, is responsible for implementing public policies in apprenticeship. With the exception noted, the conduct of programs of apprenticeship is by private sector employers or employers and

union jointly. Conformity to policies of government apprenticeship agencies by program sponsors is, on the whole, voluntary.

2. References in this statement to the national apprenticeship system means those programs and their enrolled apprentices collectively that are "registered" or otherwise credentialed by the Federal bureau or appropriate State apprenticeship authority. It is for these programs and apprentices that some information, however, limited, is available. Most guesses are that registered apprentices account for about two-thirds of the nation's total although the last comprehensive look at formal training in American industry by the Department of Labor is some 25 years old. Data for registered apprenticeship will likewise soon become out-of-date with the last official data for end of calendar year 1979 collected through the State-National Apprenticeship Program Statistics (SNAPS) system.

A brief description and more important characteristics of the national apprenticeship system is next presented in this statement followed by a discussion of the more important issues in public policy impacting upon the vitality of the system and options for addressing those issues.

*The national apprenticeship system*

Apprenticeship, by its generally accepted definition in this country, is a system of structured training given on the job supplemented by off-job study or instruction in subjects related to the trade being pursued. It is distinguished from other on-the-job training by its objective of a worker fully accomplished in a broad range of skills and family of tasks customarily making up an apprenticeable occupation and by the fact that the conditions of employment and training are known and stated in advance.

The basic fundamentals of sound training and labor standards for apprenticeship that must be met for a program to be registered by the federal agency (BAT) are enumerated in Title 29 CFR Part 29. These same standards have been adopted in principle by all of the existing state apprenticeship agencies who, in doing so, may function in behalf of the Secretary of Labor as the program and apprentice registration authority for federal purposes in their respective states.

The national system is characterized by a large number (above 80 percent of the 40 to 50,000 registered programs) of small employers with one or two apprentices and without a bargaining agent. The minority number of registered programs are sponsored by larger industrial establishments jointly with union and by groups of employers banding together as in an association, to sponsor a program most often jointly with a union. These will account for about three-fourths of the apprentices. Moreover, well over one-half of all registered apprentices are concentrated in a dozen occupations with the majority being those of the construction industry.

Most programs of apprenticeship are local, i.e., a single employer with one facility or a group of employers within the same industry banding together to operate a program in that community. Other programs may be state-wide, multi-state or national in scope including the typical multiple plant corporation programs. Finally military sponsored programs for uniformed personnel are world wide.

The federal BAT serves as the direct registration authority in 22 States, for U.S. government sponsored programs, and for certain others that are national in scope. In the remaining States, the District of Columbia, Puerto Rico and the Virgin Islands, the State functions is the approval and registration authority. About one-half of these States and territories (generally referred to as State Apprenticeship Council or SAC states) are without an operating staff.

### ISSUES IN APPRENTICESHIP

*Adequacy of program level for today and future needs*

The civilian registered apprentice level today stands at about 260,000—down more than 50,000 in three years. The historic inverse correlation between new entrants into the program and unemployment rates no longer appears operative. The recovery and recent decline in unemployment rates has not been matched by an upswing in new apprentice registrations and such is unlikely with a continuation of this Administrations policies. The decline may to some extent be related to shifts in labor demand profile, but the major cause is the deliberate and continued reduction in the number of people, both Federal and State, engaged in the promotion of new apprenticeship opportunities and programs. The direct correlation between density of apprenticeship staff and density of apprentices in a given area on the same population base can well be established. The Administrations reductions and those planned in the employment level for the Bureau of Apprenticeship and Training to about one-half the position level authorized by the Congress three years ago together with retrenchment experienced by many of the State apprenticeship agencies offers no promise the downward trend will be reversed.

The product of apprenticeship is a qualified craft worker. In reasonably stable years of the mid to late 1970's, the annual output of new craft workers had gradually risen to nearly 50,000. The Labor Department's Bureau of Labor Statistics had been estimating the ten year growth needs for skilled workers at some four million or 400,000 annually at an average rate. While those estimates may have overstated the needs it is quite obvious the apprenticeship system will not meet the requirements unless greatly expanded. Shortages of fully qualified skilled workers invariably results in higher product costs, poorer quality, delivery delays, wage pressures, and loss of any real surge capability in our defense industry base.

Compared to other industrial nations of the free world, the United States ranks far behind in apprentices as a percent of total civilian employment (.34, 1980), less than one-half the rate in France (.73) and Canada (.76), less than one-fifth the rate in Great Britain (1.87), less than a tenth of that of Italy (3.60) or one-fifteenth that of West Germany (5.18) the nation most often cited for the excellence of its apprenticeship system and national commitment to worker training.

*Expanding the program level*

Over-simplified there are three basic ways to expand the apprenticeship program. One is to move toward mandatory requirements for establishment of programs and employment of apprentices. It is not universal then through regulatory requirements such as in appropriate government procurement contracts. A second general method is to use financial inducements; in effect to purchase programs and new hires. Obviously there is a point when the inducement is great enough, a decision of not to train can be reversed. A third basic method is that envisaged by the Congress in its enactment of the National Apprenticeship Act of 1937 to advance the program by promotion, persuasion and assistance. It is the method this Administration and to a lesser extent the previous Administration expects to be used unsupported by the most modest non-labor and personnel resources. An effective promotional effort cannot be launched at no cost; prospective sponsors cannot be reached on the parsimonious travel dollars allotted for this purpose.

To reverse the downward trend in the program level and build the system to meet the nation's skilled worker requirements for defense and for competition in world markets, a determined commitment must be made. A professional staff of training experts, trained and fully supported, deployed in every major industrial center must be provided for. Staff levels should be increased as rapidly as their absorption and efficient use permits to double and redouble personnel over the next two to three years. Coupled with personnel expansion must be provision for training and retraining of both Federal and State staff, for research in apprenticeship, and for reestablishment of a comprehensive national statistical system.

*"New Federalism" and Federal-State roles in apprenticeship*

Apprenticeship does not fit well the mold of "new federalism" as a program to be operated almost wholly within a State for the benefit of the citizenry of that particular State as for example, the employment service. Nor is it a program fundamentally federal or national in character, as for example the public postal service. Certainly the highly skilled worker produced by bona fide apprenticeship is important to the economy of the State in which he or she resides; equally important to the nation's well being is the population of such workers. Moreover, while training takes place at a specific geographic location and many apprenticeships are served entirely with one employer, in one plant, or in one community in one State, others are not. Indeed in the case of apprenticeships for uniformed military personnel, the training may take place outside the United States. Thus it is evident that programs of apprenticeship may be local, multi-state or national and that "the program of apprenticeship" is of both national and State concern. With respect to "new federalism" the issue is whether the administration of public policy in apprenticeship is best performed by Federal or State government. The answer is that neither should be exclusively vested and arrangements pursued that would provide a multiplication, not duplication, of effort. National needs must be served in any event.

The extent of cooperation between the Bureau of Apprenticeship and Training and State Apprenticeship Councils is far more notable than isolated instances of friction. Present formal and informal working agreements have generally served well. Clearly there is a federal role in the collection and analysis of national data, in forecasting, in establishing national priorities, in research, in introducing new techniques, in assisting industry with model, innovative or experimental programs, in serving multi-state sponsors, in assuring standards are met for credentialling, and others including the full range of promotional and technical assistance to industry functions as it does now in SAC States not having an operating capability.

*Administrative/procedural barriers to expansion*

The hearings in April, 1937 by the House Subcommittee on Labor identified or anticipated one of the issues that remains today—namely the absence of reasonable uniformity in the requirements for registration among the various State Apprenticeship Councils. Mr. Oscar Rosenthal who at that time represented the National Association of Building Trades Employers testified before the Subcommittee on the necessity of uniformity among the States that "... Each State should accept the training of apprentices from all other accredited States ...". Other witnesses spoke in the same vein on the "... necessity for uniformity of training standards between States". The Department of Labor sought to remedy this diversity by publication in 1977 of Title 29 CFR 29, Labor Standards for Registration of Apprenticeship Programs. This regulation to which each SAC subsequently subscribed set forth the basic standards for all to use. It has failed to achieve that objective and sponsors who operate programs in more than one state continue to be confronted with diverse requirements.

Multi-employer unilateral programs sponsored by non-union employers in the construction industry are relatively new on the apprenticeship scene dating from the early 1970's. Up to that period, the Bureau of Apprenticeship and Training's own policies had discouraged such sponsorship. These artificial prohibitions were revoked and in those States where it was the direct registration agency, the Bureau began to register unilateral programs that otherwise met all requirements. Prospective sponsors of this type of program continue to meet resistance or refusal in a number of the SAC states. The regulation, 29 CFR 29, has not proven an effective instrument to remedy this problem.

A third illustration of administrative barriers to program expansion is in the procedure for determining the apprenticeability of occupations. Apprenticeability criteria are published in 29 CFR 29. Of the four criteria only one is specific. The Bureau of Apprenticeship and Training sought (and eventually did so) to establish for its own purposes, specific and objective criteria for determining apprenticeability of occupations within the definition given in the regulation. This was a deliberate effort to remove to the extent possible pressure group influence on such decisions. The Bureau has not succeeded in achieving adoption of these or substitute objective criteria by the State Apprenticeship Councils. Thus a program sponsor might conceivably have registered apprentices in an occupation in one State but find that classification unacceptable when transferring to another State.

*A legislative option*

Forty-six years ago Congress enacted the National Apprenticeship Act in a time of relatively stable labor market conditions and simple industrial environment. The Acts language is general, essentially hortative in character, and its authors anticipated use and growth of the apprenticeship system without the need for more explicit or directive public policy.

Over the same period of time the nation's industrial technology has become increasingly complex as has the economic-social milieu of work and family life. Few indeed are the workers, employers, and job unaffected by the stream of governmental employment and training policies and programs of the last few decades. In that same 46 years, government policies for apprenticeship have been administratively generated by both Federal and State to interpret, to adjust, to patch, fix and add-on as circumstances required. The national thrust for a unified program has weakened and diffused among more than 30 differing political jurisdiction approaches. Vitality is rapidly draining from the program from neglect.

The original Act should be amended to review the national thrust for a unified, better coordinated program with a new sense of direction to address specific needs. An amended Act can give legislative standing to certain administrative policies while retaining the proven concepts of the original Act. In addition to dealing with the issues outlined above, an amended Act could:

Cause to be identified occupations in short labor supply and those critical to the nation's defense posture;

Require that employers have substantial contracts with the federal government do their fair share of skill training to reduce competitive bidding for highly skilled workers, improve productivity and quality, and reduce costs;

Give substance to the original Act's hope that the States would take action with respect to their skilled worker resources by providing a mechanism for financial aid to the States when needed;

Insure that the federal government itself as a major employer will be a leader in the development of competent, highly skilled craft workers; and

Give meaning to the Congressional intent of the earlier Act for a truly national uniform system of apprenticeship and more carefully delineate Federal and State roles.

A well conceived approach to the legislative objectives was provided in H.R. 4884 offered in the first session of the 97th Congress by Mr. William Clay and Mr. Carl Perkins.

### CONCLUSION

The Subcommittees review of the apprenticeship system, a system widely recognized as the most effective means for producing the highly skilled workers essential to the nation's economic well being and defense posture, is indeed timely. Clearly a watershed point has been reached in apprenticeship. Either the system and public policies to undergird that system be vigorously pursued or the governments role in development and maintenance of our skilled resources be abandoned and the public interest ignored.

Apparently the latter course is preferred by the current Administration. The language of the 1980 Republican party platform, "we also support expansion of proven skill training practices such as apprenticeship . . ." is empty of substance. The Administration has chosen to reduce the number of persons engaged in the promotion and provision of technical assistance to the employers for establishment of programs and to camouflage and minimize the effects of the reduction of resources requested for the programs. The employment level of the federal apprenticeship agency is expecteed to be down by close of this fiscal year to one-half the level of positions Congress had authorized when this Administration took office. In all probability, another 30-35 federal apprenticeship field offices will be closed. No expansion by the States can be anticipated nor could the States be expected to perform the national role as outlined in this statement.

The hearing by this subcommittee can and should become a turning point in a positive direction for the apprenticeship system.

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Associated Builders & Contractors
of Western Washington,
*Bellevue, Wash., November 11, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor,*
*House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: I have only recently learned about the hearing being conducted on apprenticeship training, which, in my capacity as executive director of two construction trade associations, is a daily concern to me. I hope that this letter will reach you in time for consideration.

I serve as executive director for both the Washington State Electrical Contractors Association, a state group of open shop contractors, and the Associated Builders and Contractors, a local chapter of the national ABC representing merit shop contractors. Both groups have set craft training as a top priority, realizing that training of future open/merit shop construction workers is the key to the success of the open/merit shop movement. The Business Roundtable's Construction Industry Cost Effectiveness Report comes to the same conclusion. Currently 60 percent of the construction in this country is done on an open or merit shop basis, but only 10 percent of the training dollars come from the open shop—a situation that clearly cannot continue.

Because training and apprenticeship is such a major concern of these two trade groups, I spend considerable time on the issue, and I would like to share my observations with you.

The apprenticeship system is the traditional form of training construction workers. It combines on-the-job training and related classroom instruction to produce a skilled worker at the end of the apprenticeship period, generally four years for most skilled crafts.

The training of future workers must be dome with input from industry. Apprenticeship cannot exist in a vacuum. It must be responsive to the current and future needs of industry. When significant changes occur in industry, the apprenticeship system must respond to those changes. That is NOT happening in Washington State, and perhaps in other places throughout the country.

The construction industry is rapidly moving away from a monopoly by union firms. Open and merit shop contractors are doing more and more work. Often only the "downtown corridor" remains solidly union dominated. However, the apprenticeship system in this state is controlled by labor unions who regard it as their system. The Washington State Apprenticeship & Training Council's (WSATC) record of approving nonunion apprenticeship programs (both multi-employer and individual) is appalling. (See enclosed letter, appendix 1)

The union apprenticeship system cannot, by its very nature, respond to the needs of industry for future workers during a recessionary period. When a local union has hundreds of unemployed dues-paying members "sitting on the bench" the union cannot take on new apprentices, to whom they must provide employment, at the expense of employing their journey-level members. The unions' structure prevents them from being able to respond to future needs. Ironically, in this instance, organized labor is a conservative organization, unable to change and respond to its changing surroundings.

However, with the astounding increase in open/merit shop construction, the apprenticeship system must be expanded to include training for contractors and workers who chose the open/merit shop system. This will not be done easily, but it must be done. The construction industry and the country will suffer if significant changes are not made to include all employers and employees in the apprenticeship system. Maybe it is happening in other states, but it is certainly not happening in Washington, which has only one multi-employer state-approved apprenticeship program in the construction trades—in a craft which did not overlap with an existing union program.

The situation has become so dire in this state that four trade associations and some individual plaintiffs have been forced to file a lawsuit in Federal district court in an effort to coerce the state to allow non-union apprenticeship programs. (See enclosed appendix 2)

It has been my experience that the Federal Bureau of Apprenticeship and Training is providing a critical service in the entire apprenticeship system. BAT promotes, advises and coordinates for users of the system across the country. More importantly in this state, BAT helps prohibit abuses of the system by those who believe that only those who carry union cards should have access to that system. I have worked closely with the representatives of BAT in this region, and while their ability to act is restricted because this is a SAC state, if it were not for BAT open shop employers would have no recourse or advocate for the system being made available to all citizens of the United States.

Even the open shop division of the Associated General Contractors, a trade group similar to ABC, has been forced to go to the Federal Bureau of Apprenticeship & Training for approval of their training program because the state council would not approve their standards. We have chosen to enter into a lawsuit in our attempt to gain access to the state apprenticeship system, but the needs of both groups are the same . . . training.

Of course there is more involved here than merely training and access to training. As long as open/merit shop contractors are denied a state approved apprenticeship program, they are at a severe disadvantage in bidding Davis-Bacon work. Union contractors—with certified apprentices—can pay a percentage of the journey-level wage to their apprentices on public works jobs. Non-union contractors—without certified apprentices—must pay full journey-level wages to all workers on the job. This disparity in labor costs makes it almost impossible to compete, thus giving union contractors an enormous competitive edge.

There is a great deal more I could relate concerning apprenticeship in this state. I could go on at length quoting statistics and relating the tales of the non-union employer trying to provide training to his/her employees. I would be happy to do so upon request. You may be interested in knowing that the Washington State Electrical Contractors Association has been sponsoring a non-approved training program for 7-8 years and currently has more than 225 students enrolled in five locations throughout the state. The contractors understood that training could not wait for approval. ABC of Western Washington, a new group, is also in the process of establishing two training programs, with or without the WSATC's blessing.

Apprenticeship training has been the backbone of the construction industry by training its future supervisors and workers. It must continue to be so, but only if the system is opened and expanded to include all aspects of the construction industry. At the same time the open/merit shop must realize its responsibility for training its future workforce and allocate more of its resources to training of workers and educating foremen and supervisors.

Each employer should be able to decide whether or not he/she wants to operate a union or open/merit shop. Each employee should be able to choose whether or not he/she wishes to be represented by organized labor. Access to apprenticeship and training should not be dependent upon that decision. Education must be open to all regardless of race, creed, color, sex, national origin, age or labor affiliation.

The future health of the construction industry and American industry in general, the future of America's ability to compete in a world market with other industrialized nations, the future of our youth's employment opportunities depends upon the solution to the problem of accessibility to the apprenticeship system.

Thank you for this opportunity to comment. If you desire any additional information, please don't hesitate to contact me.

Sincerely,

**Kathleen B. Garrity,**
*Executive Director.*

U.S. Department of Labor

Employment and Training Administration
909 First Avenue
Seattle, Washington 98174

September 10, 1981

Reply to the Attention of

Bureau of Apprenticeship and Training

Ms. Kathy Grimes, Research Assistant
State of Washington
Senate Research Center
101 Senate Office Building
Olympia, WA 98504

Dear Ms. Grimes:

In response to the several questions you posed in your September 8, 1981 letter, the following is offered.

Question 1:

The agency and program information sheets provide data for Region X - would it be possible to break out the same information (number of apprentices, cost per apprentice, agency staffing and budget) on a state-by-state basis within the region?

ANSWER:

The U. S. Department of Labor Apprenticeship and Training resources for FY 1981 were disbursed as follows for each of the States of Region 10:

WASHINGTON (SAC State)

| | | |
|---|---|---|
| BAT Staff (6) Technicals (3) Clericals - Total | | 9 |
| BAT Budget | | $236,000.00 |
| Cost per apprentice (8500) | basic | $28.00 |
| | *plus Region costs | 6.00 |
| | Total | $34.00 |

| | |
|---|---|
| % of Regional Work force | 41% |
| % of Regional Apprentices | 51% |
| % of Regional Technical Staff | 46% |
| % of Regional Budget | 37% |
| % of Sponsors (accounts) (400) | 26% |

OREGON (SAC State)

| | | |
|---|---|---|
| BAT Staff (4) Technicals (2) Clericals - Total | | 6 |
| BAT Budget | | $162,000.00 |
| Cost per apprentice (5500) | basic | $29.00 |
| | *plus Region costs | 6.00 |
| | Total | $35.00 |

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OREGON (continued)

| | |
|---|---|
| % of Regional Work force | 35% |
| % of Regional Apprentices | 33% |
| % of Regional Technical staff | 31.5% |
| % of Regional Budget | 25% |
| % of Sponsors (accounts) (450) | 29% |

IDAHO (BAT State)

| | | |
|---|---|---|
| BAT Staff (2) Technicals (1) Clerical | - Total | 3 |
| BAT Budget | | $81,000.00 |
| Cost per apprentice (1500) | basic | $54.00 |
| | *plus Region costs | 6.00 |
| | Total | $60.00 |

| | |
|---|---|
| % of Regional Work force | 11% |
| % of Regional Apprentices | 9% |
| % of Regional Technical Staff | 15% |
| % of Regional Budget | 13% |
| % of Sponsors (accounts) (530) | 34% |

ALASKA (BAT State)

| | | |
|---|---|---|
| BAT Staff (1) Technical (1) Clerical | - Total | 2 |
| BAT Budget | | $54,000.00 |
| Cost per apprentice (1200) | basic | $45.00 |
| | *plus Region costs | 6.00 |
| | Total | $51.00 |

| | |
|---|---|
| % of Regional Work force | 5% |
| % of Regional Apprentices | 7% |
| % of Regional Technical Staff | 7.5% |
| % of Regional Budget | 8% |
| % of Sponsors (accounts)(170) | 11% |

*Regional Office operating costs are factored as an overhead of $6.00 per apprentice which is disbursed equally to the States on a number-of-apprentices factor.

All figures are rounded and based on 3rd Quarter 1981 statistical data.

Several variables can come to play in budget disbursement from the basic cost average base. These could include geographical distances for travel - variety of travel and per diem costs - number of sponsors of apprenticeship programs such as: Idaho with only 11% of the work force yet have 34% of the sponsors accounts. Also, as a rule of thumb we assess the work load by area work force which defines potential expansion for develop and install. Usually in a BAT State we estimate 800 to 1000 apprentices as one Technical's work load. In a SAC State 1000 to 1500 is a work load. This is balanced somewhat with number of programs in any given area of work. Example: BAT representative in Boise, Idaho area has within the work load 275 accounts with 800 apprentices. In the Tacoma area, the BAT representative has 65 accounts with 1600 apprentices. The responsibilities vary in regards to whether the area is a BAT State or a SAC State. In the disbursement of budget and staff, we primarily try to balance the per cent of work force and per cent of apprentices and sponsors with the per cent of Technical Staff before applying variables.

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Question 2:

There are several apprenticeship programs that operate within Washington--Bureau of Apprenticeship and Training, State Department of Labor and Industries, and the Vocational Technical Institutes/community colleges. What are the differences between these programs in their missions, population served, provisions of services?

ANSWER:

In the State of Washington only the Washington State Apprenticeship Council (Department of Labor and Industries) administrates apprenticeship programs in accordance with the State Apprenticeship Act. The one exception is Apprenticeship programs on so-called Federal areas such as Bremerton Navy Yard, Military Bases or Indian Reservations. These programs are registered nationally with the Bureau of Apprenticeship and Training with the count available to individual States for statistical purposes. Vocational divisions conduct pre-training (classroom) for entry into programs of apprenticeship and also the majority of related instruction for working apprentices are conducted at Voc-Tech or Community Colleges. A State Board for Vocational Instruction representative also serves as an ex-officio member of the Washington State Apprenticeship Council. Each of the Agencies mentioned have individual roles in the total system of Apprenticeship Training. There are also cooperative formal working agreements (attached) which attempt to define roles and eliminate duplication of effort. VA also, under DOL Standards, registers individual sponsors -- see General Comments.

Question 3:

You mentioned during our telephone conversation that Alaska and Idaho do not utilize an apprenticeship council, but are administered through your office. Any comments you have on the differences between these two states and Washington would be helpful. What are the pros and cons of utilizing a council?

ANSWER:

Since the inception of the Fitzgerald Act, which established the Bureau of Apprenticeship and Training within the Department of Labor in 1937, one of our priorities has been to actively promote and assist to establish and maintain State Apprenticeship Laws or Acts. Thirty-one States and Territories have such Acts on the books with State Councils. The basic differences between Idaho or Alaska and the State of Washington is BAT also handles all the registration of program Standards and maintenance of these programs in addition to promoting the System of Apprenticeship Training with Industry and Labor. Also, in BAT States the criteria of establishing Standards with Sponsors follows the Labor Standard Title 29, CFR 29 without a Council. The process is perhaps less cumbersome and much quicker than in Washington where the Council only meets every three months. (see recommendations) This is not to say there is, as an end result, a better system in one area (BAT State) than another (SAC State). I believe the delegation of authority is what makes a difference in the application of the process. In a SAC State the system is brought much closer to the sponsors and apprentices because of local application and State recognition. It is the intent of the Fitzgerald Act and subsequent Labor Standards that States would adopt harmonious Acts and procedures in concert with the National Apprenticeship program, as it so states in the Washington State Act.

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Question 3 (continued

BAT supports the concepts of a State Council although at times we may disagree with their application of the Act in a narrow rather than a broad sense.

Question 4:

What are your staff responsibilities in interacting with the council structure?

ANSWER:

In the Washington State Apprenticeship and Training Act as it states, (non-quote) that policies and procedures should be in harmony with the U. S. Department of Labor. When this was written into the Act in 1941 it was recognized there is a national purpose for Apprenticeship Training to meet the demands for skilled workers and for the general welfare of the Nation. The close ties with the National program was reinforced when the States with Apprenticeship Acts formed the National Association of State and Territorial Apprenticeship Directors (NASTAD) organization. Collectively they meet periodically with the Administrator of the Bureau of Apprenticeship and Training and forward suggestions and recommendations to the Secretary of Labor to further the Apprenticeship System. There are also joint Federal and State sub-committees who meet on special issues. The NASTAD Chairperson also meets and is an Advisor to the Secretary of Labor's Federal Committee on Apprenticeship. This sets the tone for the Regional and State Directors and Field Representatives to meet regularly at local levels where information and problems can be communicated. In both the Sates of Washington and Oregon - SAC States - there are formal working agreements between BAT and SAC to reinforce this policy. Also, in each State there has been adopted Labor Standards Title 29 CFR 30 for Equal Employment Opportunity and Title 29 CFR 29 which standardized nationally the criteria for Registration of Apprenticeship Programs. In order for a State Apprenticeship system to receive recognition from the Secretary of Labor the intent and purpose of these Labor Standards must be adopted by the State. Both these Standards have been adopted by the State of Washington Apprenticeship Council since 1977. It is the responsibility of BAT to monitor the State's application of these Standards and make recommendations where necessary and to assist the Council and Apprenticeship Division in interpretation and application to program sponsors. Since 1941 the State Director of BAT has been an Advisor to the State Council primarily to advise and communicate Apprenticeship and Training information nationwide. BAT also coordinated the reciprocal agreement on registration of apprentices where collective bargaining jurisdiction crosses state lines between the States of Washington, Oregon and Idaho. All three States are signatory to this agreement which enables employers to work apprentices across state lines without violation of registration policy and circumvention of other employment regulations. The bottom line is - there is open and on-going relationships with the Apprenticeship and Training Division and the State Council.

Question 5:

What changes, if any, do you forsee in the status of the National Apprenticeship Program in the coming year? If funds were cut in any of the programs operating in the state, what would be the impact on the remaining programs?

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ANSWER:

There is no question in anyone's mind who are close to the National and State budget scene that the measure and worth of programs must be measured by cost effectiveness. The BAT budget to date and forecast for '82 (at this writing) is for no increases but rather staff and budget will remain at end of FY '81 levels. (There could however be further cuts, in my opinion). In this region there have, to date, been no cuts in ceiling however, we are under a hiring freeze as are all Federal Agencies. Until the fiscal year resources levels are ironed out by the Congress there will be holes in our staff because of retirements and transfers. At the beginning of Quarter I for example we will be two (2) Technical and one (1) Clerical position short. In other words, I do not expect any increases and hope to fill our positions to the forecast ceiling. The priorities for our staff is to concentrate the majority of our time and resources in the area of expanding the Apprenticeship concept of training in so-called non-traditional trade areas, Manufacturing, Service, Wholesale/Retail Trade and the Public Employment Sector. If state funds were cut, it would put a crimp in our promotion efforts as the primary responsibility of the State is to register programs, track apprentices, and prepare necessary statistical information to the Council, Legislature and citizens of the State. The State's responsibility with their present limited staff to just maintain contact with existing program sponsors and track present registration plus preparation of new standards is limited at best. On the National and hopefully at the State level this program must be viewed as cost effective and with direct employment and progressive training and wage earning of the apprentices it pays back in taxes much more than the minimal cost of maintaining the system. No mater how you slice it - cost effectiveness is guaranteed. Despite the present unemployment levels in this State and the Region the program is still intact and there are over 8000 in washington and 17,000 Regionally receiving direct employment. As the economy increases so will the programs. The one factor that is being overlooked is the present potential to increase the number of apprentices in hundreds of occupations not now approved by the Council in Washington. (see comments).

General Comments:

I sincerely hope the above has at least in part answered your specific questions. As we discussed on the phone, there are several areas which, in my opinion, can take place to enhance and expand the program in the State of Washington. When BAT worked with the State in 1941 to establish the State Act there were few trades with apprenticeship training opportunities. The Building Trades, Printing Trades and Machine Tool Trades historically and traditionally had apprenticeship programs and over the years have maintained and improved, mostly through collective bargaining agreements, their individual craft goals. These programs are still the nucleus of the program and nationally constitute approximately 50% of all apprentices. If you subtracted these trades from the present registration in Washington State you will find very little has been done to expand the program. This past year we have had approved in this Region over 150 new sponsors of apprenticeship programs. Of that total only 8 have been approved to date by the Washington State Apprenticeship Council. To make matters worse only 24 sponsors' programs were approved in the past two years. In Alaska with the highest unemployment in the Region and only 1 staff technical BAT has approved over 20 new programs. The work force potential is only 1/10th of Washington's and 5% of the Region. There has been in Washington

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the loss of program approval by the Veterans Administration. VA approved nearly 80 new programs this past year in Washington based on the same criteria as in the State Act. All of these programs should have been registered with the State of Washington as done in the past. The Council, not the Labor and Industry Apprenticeship Division, has by their narrow interpretation of the Act excluded sponsors from participating in the program rather than including additional people. Much of this can be directly traced to the Council's action towards unilateral or non-union programs. The makeup of the Council and the general philosophy has been to "turn off" employers requesting non-union or unilateral programs. There have been rules and policies initiated by the Council in the past which were in my opinion and the Attorney General's (Washington) opinion contrary to the Act. There have been undue pressures placed on the Council by organized labor in the State to limit participation. Much of this is perfectly understandable and advocacy positions are certainly the right of these organizations. However, the Apprenticeship System was established to offer youth employment opportunities and a chance to enter the work force learning a skilled occupational trade. It was not established to use as a tool for organizing or establishment of jurisdiction. I personally temper these remarks by stating I came through a Union program of apprenticeship and support the concept of Unions' rights under collective bargaining. The Apprenticeship concept and the opportunities for youth and the Act transcends this particular philosophy. There is no question or disagreements that the programs under collective bargaining offer the very finest of trade training. However, not everyone can be a Harvard or Stanford. The Apprenticeship Act was passed to offer opportunities for all the citizens of the State to participate as long as the basic criteria and Standards are met. This trend in the past 3 or 4 years to limit programs I believe is only temporary and in no way has become the policy of all Council members. Bit-by-bit and piece-by-piece there have been several improvements initiated as to procedures which I believe will make the program viable and again in harmony with the Act. Recently a pattern standard procedure was adopted with encompasses universal provisions of requesting registration under a standard criteria. (BAT has used a pattern standard for years and we assisted in preparing the new State Standards). Once employers meet the criteria as set forth, the Council should approve the Standard without question, regardless of Union or Non-Union affiliation. The welfare of the apprentice is well protected under the new Standards which is extremely important. This program should not be used as a cheap labor or temporary source of employment.

RECOMMENDATIONS:

- There should be a review of the Act itself with the intent to streamline procedurally the approval of Sponsors' requests to enter into registration with the State under a standard applicable policy.

- There should be included provisions for more small, individual employers to participate. (BAT calls these, Individual Non-joint Standards).

- The structure of the Council should be changed to an expanded body. Representation on the Council should include membership from industries such as Building Trades, Manufacturing, Service Trades, Wholesale/Retail Trade, Forest Products/Mining and Public Sector employment. One member each representing labor and management. There should be at least two public members representing the rights of Minorities and Females since Equal Employment Opportunity is a vital part of Council actions. The Chairperson should serve without vote --

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or vote only in case of a tie. The Director of Labor and Industry or the Apprenticeship Division serves in many States.

- There should be more delegation of authority given to the Director of the Apprenticeship Division. There is very little now and staff is not being properly utilized.

- Generally, the Council should set policy, procedures and act to expand the system and let administrative actions be carried out by the Director of Apprenticeship and staff. Everything should not hinge on the Council meeting every three months where all issues are decided. If standards and criteria are adopted and set to function programmatically the administrative structure should be left to do the job.

Ms. Grimes, this has turned into a lengthy response and perhaps borders on the negative rather than on the positive. It is my hope the Legislature will look at the State program as the dividend it is. It should be expanded rather than cut back. You don't, as the saying goes, "throw out the baby with the water". This program of apprenticeship with all the potential there is in Washington and the continuing need for skilled and productive people coming into our industries can repay hundredfold the minimal costs incurred. I believe the State should respond affirmatively to the direct employment concept Apprenticeship offered. The programs should continue as a State vehicle serving the citizens of this State.

Sincerely,

VERNON P. NILSEN
Director

Attachments
Letter of Understanding and
Cooperative Working Agreement,
State of Washington
Federal Register Title 29 CFR 29
Federal Register Title 29 CFR 30

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Associated Builders & Contractors
of Western Washington,
*Bellevue, Wash., May 11, 1983.*

To: All members.
Subject: Association files antitrust lawsuit against Washington State over non-union apprenticeship program approval.

The Associated Builders and Contractors of Western Washington, along with three other construction industry trade associations and certain members, have filed suit against the State of Washington, its Department of Labor and Industries and certain members of the Washington State Apprenticeship and Training Council (WSATC) in Federal district court in Seattle on May 10, 1983.

The other plaintiff associations are the Associated Builders and Contractors, Inland Pacific Chapter; the Washington State Electrical Contractors Association; and the Washington Association of Plumbing-Heating Cooling Contractors.

The Association and other plaintiffs assert that a regulation adopted by the Council requires non-union open shop contractors wanting a multi-employer approved apprenticeship program to agree to fix wages in violation of antitrust law prohibitions on price fixing.

The plaintiffs assert that the defendants have agreed to refuse approval of certain kinds of non-union apprenticeship training programs in an effort to preclude open shop firms from effectively competing for public works projects in Washington State. Plaintiffs refer to a May 1981 memorandum from the Office of the Washington State Attorney General and a letter from a U.S. Department of Justice Antitrust Division attorney which the plaintiffs say support their position that the actions of the defendants are in violation of antitrust laws.

The Association and the other plaintiffs in the suit are asking for injunctive and declaratory relief from Federal district court to prohibit the alleged violations of antitrust laws. The Washington State Apprenticeship and Training Council has the authority to change the disputed rule and practices without legislative action.

The plaintiffs believe that if the rule and practices are rescinded and not replaced with another restrictive regulation, non-union construction contractors could sponsor approved apprenticeship programs, improve the educational opportunities for their employees, compete fairly for public works projects and perhaps lower the cost to taxpayers for government-funded construction projects.

## BACKGROUND INFORMATION ON THE ASSOCIATION'S LAWSUIT ON APPRENTICESHIP

The Washington State Apprenticeship and Training Council (WSATC) was originally established to promote aprenticeship, approve proposed apprenticeship programs and to carry out the intent of the Fitzgerald Act of 1937, the national apprenticeship law, and similar state legislation.

The Council adopted a Washington Administrative Code (WAC) rule in February 1980 which says:

"WAC 296-04-270(2)(c). The [illegible] of the progressively increasing scale of wages (RCW 49.04.050(5)) which [illegible] provide that the entry level wage for all apprentices shall be at least a precentage of the journeyman scale set by the applicable collective bargaining agreement or at least a percentage of the prevailing wage for the craft for the area set by the United States Department of Labor pursuant to the Davis-Bacon Act (40 USC Sec. 276) where no collective bargaining agreement is in effect. In the event an apprenticeship program is proposed for an area already served by an apprenticeship program, the new program's wage scale shall be identical to or greater than that of an existing program. . . ."

This WAC rule requires all employers signatyory to a multi-employer apprenticeship program to pay the same wages to their apprentices and to match or exceed the apprenticeship wages of the existing program, which is the union wage in nearly every case.

On the other hand, federal and state antitrust laws prohibit a group of employers who do not have a collective bargaining agreement to pay a set scale of wages except under certain very limited and specific conditions.

This WAC rule was proposed by one of the defendants, G. David Hutchins, when he was a member of the WSATC, representing IBEW Local 46. Mr. Hutchins is now Assistant Director for Apprenticeship, Department of Labor and Industries and Secretary of the WSATC.

The state apprenticeship law's only reference to apprentice wages states: "RCW 49.04.050(5). A statement of the progressively increasing scale of wages. (must be included in apprenticeship standards.)"

There is no provision in federal or state statutory law that requires apprentice employees of open shop contractors to be paid union wages or the same wages as an existing approved apprenticeship program. Neither the Fitzgerald (Apprenticeship) Act nor the companion state legislation contain either an express or implied exemption from antitrust laws. The Department of Justice Antitrust Division has issued a business review letter reserving its right to challenge a proposed directive of the Department of Labor under which apprentices would be required to be paid at a rate not less than a fixed percentage of the arithmetic average of journeyman rates as applied to open shop apprenticeship programs.

The effect of the Council's rule is to prohibit non-union employers from sponsoring multi-employer approved apprenticeship programs and having apprentices that are registered with the Washington State Apprenticeship and Training Council. The construction industry by its very nature must have multiple employer standards rather than single employer standards. The plaintiffs maintain that there is only one non-union multi-employer program in the construction industry that has been approved by the Council and that was in an area not served by a union apprenticeship program.

Contractors without registered apprentices are at a severe disadvantage in bidding on any job involving federal, state or local government funds because the Davis-Bacon Act allows contractors with registered apprentices to pay their apprentice employees a percentage of the prevailing wage (on a sliding scale based on experience). Contractors without registered apprentices must pay the full prevailing wage to all workers, both journeymen and trainees—dramatically increasing labor costs and therefore excluding open shop contractors from effectively competing for public works projects and, according to the plaintiffs, this restrains trade in violation of the state and federal antitrust laws.

The suit's plaintiffs claim that trainees not registered to an approved apprenticeship program have suffered from decreased employment opportunities and are precluded from gaining training on public works projects.

In addition to the injury done to non-union contractors and their trainees and journeyman employees, the plaintiffs assert that the state's taxpayers have to pay millions of dollars a year in inflated construction costs by artificially raising and stabilizing wages.

## FACTS AND FIGURES

Bureau of Labor Statistics estimates that there will be a need for *2 million* additional construction workers by 1990.

It is projected that current training and apprenticeship programs will fill only *one quarter* of those jobs, leaving a shortage of *1.5 million* jobs.

The Rand Commission projects a need for a *500–1000 percent increase* over current certification rates to meet the need for skilled workers for the rest of the century.

It is projected that the Pacific Northwest will experience a *growth rate of 1.4* for the next 20 years, compared to *0.8* for the rest of the nation.

The Business Roundtable estimates that *60 percent* of this country's construction is done open shop, yet *only 10 percent* of the training is done in the open shop sector.

The Business Roundtable concludes, "There is a need for a *recognized and accredited* training curriculum that can be utilized by open shop contractors to train craftsmen for industrial work by modern skill-related methods, particularly in the specialized trades." (Emphasis added.)

During a one-year period in the early 1980's *150* new apprenticeship programs were approved in the region (Washington, Oregon, Idaho and Alaska). Of those only *8* were approved in Washington, even though Washington has 41 percent of the region's work force.

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International Brotherhood of Electrical Workers,
Local Union 697,
*Hammond, Ind., November 14, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor,*
*House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Sir: I have been associated with the Bureau of Apprenticeship and Training, U.S. Department of Labor for many years. My first encounter was as an electrical apprentice and from there I served six years as a member our Joint Apprentice and

Training Committee before holding my present position. The Bureau has been most helpful in handling problems relating to our program and industry.

It appears of late this service and interest has suffered due to certain restrictions and a declining staff.

I personally fail to see any just reasoning in discontinuing the National Apprentice Activity when in todays labor market there are so many problems dealing with unemployment and underemployment.

We in our community, would appreicate your support in properly funding and staffing the Bureau of Apprenticeship and Training.

Sincerely,

ROBERT L. LAUER,
*Business Manager,*
*Local Union 697, I.B.E.W.*

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NATIONAL TOOLING & MACHINING ASSOCIATION,
*Fort Washington, Md., August 16, 1983.*

Hon. JOHN N. ERLENBORN,
*U.S. House of Representatives,*
*Washington, D.C.*

DEAR REPRESENTATIVE ERLENBORN: The 8 members of the National Tooling & Machining Association in your district need your help. Our industry is the keystone of all manufacturing.

The tooling and machining industry is critical to our country's health as it makes possible the existence of virtually every other manufacturing industry. Tooling is, in its simplest sense, the means of production. In its current modern industrial usage, tooling refers to the special, often one-of-a-kind products manufactured to desired levels of uniformity, accuracy, interchangeability, and quality. It includes custom designed machine tools or machining systems which serve a specific function or series of functions related to the manufacture of specific end products. Machining involves the use of mechanical, electrical, chemical, and photo-optical techniques to form material, usually metal, under precisely controlled conditions.

Our industry supplies the necessary precision tooling and machining for such vital industries as defense, automotive, aerospace, appliance, business machines, electronics, agricultural implements, ordnance, transportation, environmental, construction equipment, nuclear, and many more. In point of fact, nearly every manufacturer does business at one time or another with the contract tooling and machining industry.

Despite the sophistication of the equipment used in our industry, we depend as much as ever on the highly refined skills or our innovative toolmakers, diemakers, moldmakers, and machinists. These are the most highly skilled craftsmen in modern industrial society and the typical four-year apprenticeship requires 640 hours of classroom study and 8,000 hours of on-the-job training.

The cost of training these individuals is very high. An investment averaging $60,000 is required for everyone on the shop floor. They are trained in the manner of traditional apprenticeships, with highly skilled journeymen foregoing many productive hours to work with their apprentices. As a result, the apprenticeship results in a significant financial loss to the employer, typically a small businessman with 20-25 employees, during his first year of employment and often in the succeeding year as well.

The result of these high training costs has been a chronic shortage of skilled labor in this field. Recognizing the importance of this skill to the defense industrial base and the overall economic health of the country, the U.S. Department of Labor has for over 20 years funded pre-apprenticeship training programs for our industry.

Unfortunately, we have recently learned that they are most unlikely to fund additional training in the next fiscal year, despite language in the new Job Training Partnership Act of 1982, which calls for programs such as ours.

The result of a cancellation would be to aggravate the problem still further, hurting our members' training capability in your district. In many cases, the 12-16 weeks of pre-employment training provided by our program makes the difference in whether our members can afford to hire an additional apprentice. Those receiving the pre-apprenticeship training are much further along and represent a much quicker payback, a matter of great importance to a small company. The result of a cancellation of our program will be fewer new jobs created in your district and a greater reliance on imports of the crucial products provided by our industry.

You can help us by seeking to convince Assistant Secretary of Labor for Employment and Training Albert Angrisani of the crucial importance of this program. Our members would be most appreciative if you could write Mr. Angrisani at the U.S. Department of Labor, Room S2307, 200 Constitution Avenue, NW., Washington, DC 20210 and express your strong support for our program.

Cordially,

BRUCE N. HAHN,
*Manager, Government Affairs.*

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NATIONAL TOOLING & MACHINING ASSOCIATION,
*Fort Washington, Md., September 30, 1983.*

Hon. AUGUSTUS F. HAWKINS,
*Rayburn House Office Building,*
*Washington, D.C.*

DEAR REPRESENTATIVE HAWKINS: We were very pleased to hear that the House Subcommittee on Employment Opportunities will be conductng oversight hearings on the National Apprenticeship Act and other training related matters. The National Tooling and Machining Association represents an industry which has the second largest number of registered apprentices in the United States. This Association has had a longstanding interest in the apprenticeship system and has been actively engaged in helping the industry improve training on an overall basis. We welcome the opportunity to testify and offer our thoughts and comments.

In general, apprenticeship training in the United States has been in a steady decline when compared to the growth of the overall work force. There are many reasons, real and fictional, that have worked against the apprenticeship system.

The Federal and State governments must develop cooperative systems with industry to improve our training systems. The critical shortage of skilled workers has already seriously impaired America's competitive position in the world market. The skills shortage has a direct bearing on American economic welfare and national security. Enclosed are two recent articles about a study which clearly points up one of the more significant reasons why small companies are finding it particularly difficult and expensive to continue training. Also enclosed is a brief paper describing the National Tooling and Machining Association's position on training.

The United Staes does not have a comprehensive policy which will insure the maintenance of an adequate, well-trained work force. We sincerely hope that your hearings will result in a clear-cut policy addressed at this serious shortcoming. NTMA looks forward to these hearings.

Sincerely

JOHN A. BELL,
*Manager, Training Activities.*

## CRITICAL SKILLS FOR AN ESSENTIAL INDUSTRY

The independent contract tooling and machining industry is represented by the National Tooling and Machining Association (NTMA). It is made up of approximately 14,000 small custom metalworking manufacturers which design and build special tools, dies, jigs, fixtures, molds, gages, special machinery and precision machined parts. The products of this relatively small industry are essential for virtually all mass production. All product manufacturers rely heavily on the talents, skills and ingenuity of the contract tooling and machining industry. The industry has well earned its nickname: "keystone of mass production". Congress on several occasions has noted that the tooling and machining industry is a basic industry upon which the economic welfare and security of the United States depends.

Individual contract companies use a wide variety of sophisticated and expensive equipment. Tolerances of one ten-thousandth of an inch (.0001") are common. Computers are used regularly to design and control manufacturing operations. However, the technologically advanced equipment used throughout this essential industry is useless without a highly skilled and talented workforce. Total employment in the contract tooling and machining industry is approximately 350,000 persons. This relatively small but highly skilled workforce however is crucial to the maintenance of America's high standard of living and international security.

Unfortunately there is a growing shortage of the high skills required by the tooling and machining industry. For several generations American society and, particularly, the American school systems have been college oriented. Vocational schools are typically considered "holding pens" for those students who must complete the requisite number of years of secondary education. Increasingly the education/training burden has been shifted from the schools to the employers.

The sharply increasing cost of training is very difficult for small companies to absorb, particularly for tooling and machining companies whose average national employment is only 25 persons per company. There are basic costs which must be incurred in even the most modest training operation and, accordingly, it costs nearly as much to train one or two people as it does to train 15 or 20.

An apprentice typically requires four years to reach journeyman status. The apprentice receives a minimum of 8,000 hours of on-the-job training on equipment which costs an average of $40–60,000 per employee. Highly skilled journeymen must divert many hours from productive work to assist and train the apprentice. As a result it is generally agreed that in most cases the entire first year of the four-year apprenticeship program represents a significant net financial loss for the employer.

Recognizing that economies could be realized through a nationally coordinated training program, NTMA, the only national trade association representing the contract tooling and machining industry, inaugurated a pre-employment training program on a national scale in 1964 NTMA's pre-employment training program was the prototype which has since been copies by many other industries. Because of the essential nature of the tooling and machining industry, NTMA has received continuous funding assistance for this training program from the U.S. Department of Labor (DOL) since 1964. This funding assistance has helped NTMA provide pre-employment training to over 16,000 persons. On average, 80% of the starters have graduated and secured gainful career employment as machinists, tool, die and moldmakers, or machine operators in American industry.

NTMA's widely regarded and copied pre-employment program is an accelerated, full-time (35 hours per week) course with a 12-week term. Trainees receive hands-on machine training experience combined with classroom instruction in blueprint reading, basic shop math and machine shop theory. NTMA has developed and refined a wide array of specialized training materials and techniques to insure the continued success of this nationally coordinated program.

This NTMA program has consistently produced entry-level job candidates at a total cost of less than $2,000 per trainee. One hundred and twenty (120) separate, distinct manufacturing communities across the country have been served by this nationally coordinated program. Typically the DOL funding arrangements have been 12-month contracts enabling the Association to pretrain 1,000 persons. In recent years the program has not provided a stipend or allowance for trainees. For the past several years overall DOL/CETA funding has been curtailed substantially and NTMA contracts have been cut back as well. The current abbreviated 10-month contract expires September 30, 1983. This contract, in the amount of $667,000, authorizes NTMA to start only 400 persons in training.

The recession abatement and the attendant increase in manufacturing activity will accentuate and aggravate the skills shortage situation. The Administration's proposals to rebuild American military preparedness will place additional demands on the thin manpower capacity of the tooling and machining industry.

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[From Business Week, Sept. 5, 1983]

## SMALL BUSINESS: THE NATION'S TRAINING GROUND

A lot of people suspect that small business contributes more to economic vitality than it generally gets credit for. But providing this is another matter. Writing in the latest issue of The Public Interest, American University's Bradley R. Schiller advances the case a notch. He finds that small companies are the nation's major training ground for new workers. He shows that they are subsidizing the training costs of large corporations, since many of these workers ultimately work for large companies. Ironically, Schiller points out, big companies, not small ones, get most federal training grants.

In a study for the Small Business Administration, Schiller examined the earnings records of a sample of young male workers. He found that companies with fewer than 100 employees hired 67 percent of first-time workers, more than their 58 percent share of total employment. But nine years later, small business had retained only 51 percent of the first-time workers.

The reason behind this "corporate kidnap" is higher wages, Schiller explains. On average, the worker who went to a big company from a small one earned 23 percent more in the first year with the new company—an increase that would have taken him years to attain by sticking with his first employer.

Large companies pay more because their profits are higher, says Schiller. And they usually have more capital per worker, so worker productivity is higher. Because they can afford higher wages in the first place, big companies also benefit by being able to choose experienced workers, leaving the costs of initial training to small companies.

## Two-Thirds of Workers Start Out at Small Companies, Study Finds

(By Meryl Gordon)

New York.—W.F. Rothwell, president of the Universal Fastener Co. of Charlotte, N.C., says he's given up on hiring young workers, because the aggravation isn't worth it.

"I'm so gun-shy of young people, those just coming out of high school and college, because you bring 'em in, train 'em, give 'em descipline, and then they're recruited away by large companies or the competition,'" said Rothwell, who runs a specialty hardware distribution firm with 70 employees.

As a result, he said, "I try to hire middle-aged to older workers, for their stability."

Rothwell's frustration is very understandable, and probably widespread, in light of a recent study by American University professor Bradley Schiller for the Small Business Administration.

Schiller, using Social Security income data, tracked work histories of 22,340 young men from 1957 to 1971, focusing on where they got their first real jobs (a job held more than six months and paying more than $1,000 a year), how long they stayed, and what they did next.

"Two-thirds of them got their first jobs in small buisnesses—companies with 100 employees or less," Schiller said. But two years later, a large majority of those workers were lured away by big firms, with average salary hikes of 25 percent, he said.

His conclusions: "Small business is providing a disproportionate share of jobs and training opportunities. The big corporations are able to avoid initial training costs by letting small firms do it."

Small firms, particularly those with skilled workers are disturbed by this trend, according to William Dennis, research director of the National Federation of Independent Business, a Washington, D.C., lobbying group with 560,000 members.

"The machine tool industry has had a terrible problem with this," he said. "They're always complaining about training a guy and losing him to a larger firm."

Small businesses generally can't compete with large companies in terms of salaries, benefits, and job opportunities.

"The only carrot you can offer has to do with personality," said businessman Rothwell. "Someone has to be more independent" to want to work for a small firm, he said.

Lisa Mauer, director of marketing service for Rickert Industrial of Milwaukee, an industrial distributing company with 50 employees, agrees. She said the firm, run by her father, Bruno, "has had very low turnover," with employees staying an average of nine years. "The atmosphere is very personalized," she said. "Everyone is very open."

But she acknowledged that ambitious employees could become frustrated working at a small firm, since there aren't many opportunities to advance with the company. "We aren't one of those 'senior vice president, assistant vice president' sort of places. There just aren't that many places to go," she said.

Beyond exploring the problems of small businesses in keeping workers, Schiller's study of young workers is intriguing because of the implications it has for government policies.

Although small firms provide the majority of first jobs for young male workers, Schiller said, "Large businesses get the lion's share of all subsidies for job training." That's primarily because "small business found it isn't worth their while to go through all the red tape" to get government breaks.

CENTER FOR CAREER ALTERNATIVES,
*Seattle, Wash., November 8, 1983.*

Hon. AUGUSTUS F. HAWKINS,
*Chairman, Subcommittee on Employment Opportunities, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR MR. HAWKINS: I am writing to express my concern over the funding cutbacks of filed apprenticeship program activities of the Bureau of Apprenticeship and Training (BAT). It is my understanding that the parent organization, the Employment and Training Administration, is at this moment decentralizing the BAT's apprenticeship program activities to the states. This should not be allowed to continue. If the states are the only source for the promotion and development of apprenticeship, minority opportunities will decline.

The Center for Career Alternatives (CCA) has had four years of *direct* experience working with local BAT. Their staff is highly competent and have been most helpful in providing our clients with apprenticeship information, trade related employment assistance and career counseling. When problems have arisen with regard to apprenticeship, the BAT has interceded successfully between the affected parties and helped to bring the problem to resolution. Their staff is knowledgable and attuned to the problems and needs of minorities as well as the general population attempting to enter and remain in apprenticeship. In addition, they have the necessary capabilities and self-starting initiative to continue to provide more opportunities for minorities in apprenticeship.

I would appreciate your taking a general interest in behalf of the Bureau of Apprenticeship and Training and lending your strong support to them. They are doing an outstanding job!

Sincerely,

ALAN SUGIYAMA,
*Executive Secretary.*

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STATE OF DELAWARE,
DEPARTMENT OF LABOR,
*Wilmington, Del., November 8, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, U.S. House Committee on Education and Labor,*
*Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: You have asked for my written comments on the status of the Apprenticeship Program and its future. I am pleased that the House Committee on Education and Labor is planning to conduct hearings on this subject and by doing so, bring appropriate attention to the apprenticeship system. Of all of the government's manpower training programs apprenticeship has probably received the least amount of revenue and yet seems to have achieved one of the most cost-effective records of training programs that I have reviewed. As an example of this cost-effectiveness, here in Delaware, about $4.00 in Federal, State and local revenue is realized for every $1.00 invested in the apprenticeship system.

In the current apprenticeship system, young apprentices generally finish high school, having taken a variety of courses, and then enter an aprenticeship program at age 18 or older. A more traditional approach is taken in Germany, however, under which youths have finished their basic education by the age of 16, and are enrolled in a three-year apprenticeship. While the German system is voluntary, the support given it by government, business and unions is so complete that apprenticeships are a prerequisite for over 450 different job classifications.

In addition, technological changes are occurring in the economy which, are increasing the demand for an industry—specific trained workforce. Recent studies show that 20% of the existing jobs in the auto industry will be performed by computer-controlled machines by 1985 and will reach 50% by 1995. This requires retraining of these "displaced workers" in order to keep pace with this technology. As an example of this, one of Delaware's two local auto manufacturing companies, General Motors, has just instituted a new apprenticeship training program, specifically to train electronic technicians to repair their computer-controlled robotic equipment. General Motors' decision was based on simple economics and the fact that they could not find individuals with the skills required in the existing labor market.

The future should bring the Federal Government closer to the states in accordance with their individual manpower needs in a real partnership. In a state such as Delaware, which has in place its own self-sufficient apprenticeship agency, the Federal government could share and participate in promotional efforts, educational efforts to both the private sector and the school system, by being a national resource and data center, and by encouraging multi-state programs.

The Federal Bureau of Apprenticeship and Training could offer other support resources, while at the same time, encouraging those state that do not have state apprenticeship offices to establish them in coordination with the Federal government and other states. Most important would be the Federal lead in determining the anticipated retirements of skilled workers during the next two to five years on a national level and bridging the gap to insure their replacement in a scheduled and timely manner. It may also be appropriate to look at a restructuring of the national apprenticeship system along more traditional lines as seen in Europe and to consider competency in skill areas as a basis for enrollment and progression in an apprenticeship program in lieu of the current strict timetables.

Obviously, these are but a few items that the committee may wish to look at, but let me conclude with this thought. The apprenticeship training system affords a practical approach to help resolve this country's shortage of skilled workers. The committees' expressed interest in seeing the apprenticeship system strengthened is welcome news.

These youths, trained by industry, are given considerable responsibility and experience at an early age and are excepted as good potential employees in their field. It is no coincidence that the unemployment rate for youth in Germany averages 5 percent, in contrast to 18 percent in the United States.

During the recession, America's inability to train blue-collared workers to fill industry demands is hidden. As the economy expands, however, shortages of skilled workers in some areas are evident. The ups and downs of the business cycle and the long period of time necessary for adequate training of the workforce almost guarantee shortages of skilled employees during periods of rising business volume.

Conversely, durig recessionary times where production demand declines, for example, in the precision metal working industry, studies revealed that while total plant employment in that industry dropped by just under 6% during the first half of 1982 in the fact of recessionary pressure, industry employment of skilled journeypersons and machine operations declined by only 4$, while the number of apprentices and trainees employed, fell by fully 18%.

Adequate provision of the skills training necessary to meet our changing employment requirements will be a challenge for us all, and certainly the apprenticeship system has a vital role to play in providing that training.

Sincerely,

DENNIS C. CAREY,
*Secretary of Labor.*

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NEW MEXICO HOME BUILDERS ASSOCIATION,
*Albuquerque, N. Mex., November 10, 1983.*

Congressman MANUEL LUJAN,
*Longworth House Office Building,*
*Washington, D.C.*

DEAR CONGRESSMAN LUJAN: Concerning the House Labor Committee hearings on Apprenticeship, my schedule does not permit me to testify. However, I would like to include this written comment to the Committee if your time permits.

The New Mexico Home Builders Association has participated in apprenticeship programs for ten years. Our "Standards" were the first open-shop standards approved in New Mexico.

New Mexico has a Bureau of Apprenticeship and Training Representative, but the direct control over programs in New Mexico is done by our State Apprenticeship Council.

As the Committee listens to testimony, I would like them to consider several of my observations.

Apprenticeship programs in New Mexico exist strictly for the benefit of employers. Most employer participants are involved because having apprentices enables them to pay less than journeyman wages to apprentices on public works building. Yes, there are contractors among the open-shop sector who choose to participate because they recognize the value of trained people, but they are few. For everyone involved, from the apprentices, to the contractor, to the sponsoring organization, the myriad requirements in the Standards and in the Rules and Regulations from the State Apprenticeship Council are bewildering. The only contractors who are willing to undertake everything involved must either benefit financially or be organized (where there is no choice). The value of training to the apprentice gets lost in the shuffle either way.

In New Mexico the organized sector has manipulated apprenticeship to the best of their ability to keep open-shop contractors out of heavy commercial construction. This effort continues today. Anyone reviewing the actions of the organized labor sympathizers on the State Apprenticeship Council over the years must come to that conclusion.

The Federal Equal Employment Opportunity regulations designed to allow females equal access to the trades have been a disaster. Women have used the leverage they possess to damage well-meaning contractors who have hired them. Contractors who truly attempted to train apprentices in the past no longer participate because of EEO requirements.

In conclusion, apprenticeship in the present form doesn't work very well. The good intentions and high ideals of apprenticeship have been perverted and changed into weapons. The volumn of work done by contractors using apprentices continues to shrink. When compared with the results to the apprentices the efforts spent on apprenticeship today in New Mexico cannot be justified.

Thank you for your time.

Sincerely,

Jack C. Milarch, Jr.,
*Executive Vice President.*

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Western Nuclear, Inc.,
*Lakewood, Colo., November 11, 1983.*

Mr. Tom Royals,
*Liaison Officer, Committee on Education and Labor, U.S. House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: It is my understanding that a hearing is scheduled regarding apprenticeship programs. I feel it my duty and obligation to respond and express my sentiments regarding apprenticeship training programs.

I have been a strong supporter of apprenticeship programs for a number of years while employed by another corporation. During these years of experience, it has been my observation that this type of training has resulted in a stable, productive work force which was just the opposite prior to our implementation of a formal apprenticeship training program.

At present, we are in the process of registering a four-year apprenticeship training program. This program will be registered with the Spokane Tribe of Indians and Western Nuclear, Inc. as joint sponsors. It will be for Mine Electricians, Mine Mechanics, Mill Electricians, and Mill Mechanics. The Spokane Tribe of Indians will receive most of the training benefit due to or preferential hiring agreement.

It appears to me that training may be the answer to many of our nation's economic problems today. Many basic industries, particularly mining and steel, have suffered severe cutbacks and possibly will never return to their original production levels. Consequently, many employees are out of work and require additional or cross-training to become employed and productive again. I believe this training could be available through additional apprenticeship programs. Statistics reveal that unemployment is on the decrease so some of these displaced workers are finding new employment in other industries. Surely, if more funding were made available for upgrading or retraining, these new employees would become more stable and productive.

It is my candid opinion that the Government must continue to cut budgets, but surely not in an area that is as important as training workers to be journeyman, enabling them to retain employment and become more productive.

Very truly yours,

F. A. Johnson,
*Director, Industrial and Public Relations.*

COMMONWEALTH OF KENTUCKY,
DEPARTMENT OF LABOR,
*Frankfort, Ky., October 3, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: We most certainly support the Congressional Committee on Education and Labor's interest in strengthening the National Apprenticeship Program. I recommend that a good start toward achieving this goal would be through a strong committment and legislation by Congress to provide federal matching funds to states as an incentive to support the federal committment. Follow this up with National Apprenticeship policies formulated and implemented by the U.S. Department of Labor as a priority under the direction of Congress to meet this committment. Without this total committment at the federal level, individual state apprenticeship agencies and programs are facing dissolution as a very real possibility resulting from state budget cuts with more in the offing.

In response to employer complaints about their training apprentices to maintain desirable journeymen levels in their industry while many employers refuse to train, I recommend that federal tax incentives be provided to Sponsors of registered apprenticeship training programs based on the number of registered apprentices trained and completed. In my opinion, this would assure a more continuous flow of registered apprentices and alleviate to a degree the occurrence of cyclical skill shortages occurring periodically due to economic downturns and the subsequent loss of continuity of training in many apprenticeship training programs.

In order to ensure a partnership concept and a coordinated working relationship between the Bureau of Apprenticeship and Training and State Apprenticeship agencies, I recommend a clarification of their respective roles and participation of federal policy makers with B.A.T. and State Labor Department representatives in discussions of National apprenticeship/administrative policies and delineation of areas of responsibility. There is a need for a central Apprenticeship and Training agency at the federal level which provides oversight and technical support to state apprenticeship agencies. It is my opinion that without this central support agency, the nation's apprenticeship program will become fragmented and the degree of effectiveness of each state's apprenticeship program would be impacted adversely by its removal.

The national apprenticeship program of today has lost its thrust as a result of being assigned a low level priority in the U.S. Department of Labor; Employment and Training Administration. This becomes evident when you consider the abolishment of the State and National Apprenticeship Reporting System which provided each state apprenticeship agency with vital national, regional and individual state apprenticeship data from throughout the nation. This data reflected the broad involvement of the private sector in registered apprenticeship training in individual industries and occupations and served as a tool for evaluating progress of affirmative action in recruitment and registration of minority and female apprentices. I recommend national policy which recognizes the effectiveness of the National Apprenticeship Program in the private sector and sees to the publicizing of this recognition. At the present we have the strange situation existing where the most successful and effective private sector supported skills training which is embodied within the National Apprenticeship Program, receives little or no public recognition. When you consider this type of national approach and low priority apprenticeship policies, there is no mystery as to why we need an infusion of national commitment into out nation's apprenticeship training program. In my opinion, if this federal commitment is not forthcoming in the immediate future the apprenticeship training system and our national program is going to languish on the vine.

Activation of the dormant Federal Committee on Apprenticeship at this juncture is vital to the National Apprenticeship Program and its future. Close communication between the Committee and the U.S. Secretary of Labor concerning apprenticeship training recommendations by the Committee, is sorely needed. I recommend that representation on the Federal Committee on Apprenticeship be broadened in order to provide for more input from states.

Looking to the future and addressing the shifting skills training needs of private industry relative to technological advances in any industry, should be the responsibility of our National Apprenticeship Training Program with close cooperation and support to states in accomplishing this task. It is already the most time proven adaptable method for training persons in skills which will provide the individual with long term employment opportunities and the versatility to advance themselves up a career ladder. With this concept in mind, I recommend close Congressional attention to recommendation for investment and commitment in our National Apprenticeship Program and consideration of the economic benefits realized by our Nation as a direct result of utilizing this program as the best training system for equipping persons to meet the labor market demands of today and in the future.

Sincerely,

THELMA L. STOVALL,
*Commissioner of Labor,*
*Kentucky Department of Labor.*

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STATE OF MARYLAND,
DEPARTMENT OF HUMAN RESOURCES,
*Baltimore, Md., September 23, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: This will respond to your letter of August 29, 1983 in which you requested written comments on the state's current operation and the future of the apprenticeship program. As Secretary of the newly created Maryland Department of Employment and Training, which will assume responsibility for administering the Maryland Apprenticeship and Training Council on October 1, I am pleased to respond to your inquiry.

Currently, the Maryland Apprenticeship and Training Council (MATC) consists of seven (7) members: three (3) represent employees and/or employees' organizations, three (3) represent the business and industrial community, and one (1) is a public member. The members of the MATC are appointed by the Governor with the advice of the Secretary of Employment and Training and with the advice and consent of the State Senate. At present, one business/industry representative's position is vacant but should be filled within the next 30 days. The MATC also has on staff five (5) field representatives whose function is to encourage business and industrial employers to register apprenticeship programs with the MATC.

The United States Department of Labor's State Bureau of Apprenticeship and Training (BAT) and the MATC have a very harmonious working relationship. The State BAT Director and two staff field representatives work closely and cooperatively with the Council. However, one State BAT field representative's position has remained unfilled for six (6) months. Filling this position is the responsibility of the Regional Director of the USDOL-BAT. We believe that a fully staffed State BAT is essential to the future of a viable apprenticeship program. Strong, efficient and cost-effective apprenticeship programs are badly needed and sufficient personnel are needed at both the federal and state levels to assist sponsors in developing these programs. In particular, the Bureaus of Apprenticeship and Training should be stronger than the individual state councils because the bureaus must be in a position to support businesses and industries which are diversified and which operate under more than one state's jurisdiction.

Currently, Maryland has 574 registered apprenticeship programs with a total of 4,366 enrolled apprentices. The number of enrollees in an individual program ranges from one (1) to 1,115. Generally, the number of enrolled apprentices has been steadily declining while the number of sponsors remains fairly stable. However, the rate of sponsor turnover is high. There are three factors which contribute to this situation: 1) the poor economy, 2) insufficient BAT and MATC field staff to service current and potential program sponsors, and 3) the inability to access additional funds as the fiscal year progresses to fund new/additional programs. In summary, since 1971, the rate of program completions increased by about 21%, while new enrollment declined by about 22%.

The MATC maintains a viable linkage with the Maryland State Department of Education. In its FY 1984 budget, the department distributed $581,194 to state and local educational agencies for the purpose of providing apprenticeship-related instruction to individuals enrolled in MATC apprenticeships. The department also has an ongoing pre-apprenticeship program which links schools and employers in an effort to involve students in work-study experiences which can lead to actual apprenticeship enrollment once students leave school. This program is being operated on a pilot basis in several subdivisions within the state and is showing very favorable results.

The future of the apprenticeship program will ultimately depend on the degree of commitment and cooperation among all concerned entities: government at all levels, business, industry, unions, the educational community, and the sponsors of other training programs. In particular, it is imperative that federal funds which are allocated to the states under the Vocational Education Act, as amended, be made available to fund apprenticeship programs. Under the Act, funds from which monies for apprenticeship training can be drawn are made available to the States' Supervisors of Vocational Education to be disbursed at their discretion. To date, no federal funds have been allocated to apprenticeship training in Maryland from this source. This is a situation which urgently needs to be remedied.

This Department is strongly committed to the future of the apprenticeship program in Maryland and we would welcome the opportunity to send a representative to testify at the committee's hearings or to meet with you or any committee member at a time which you may select.

Sincerely,

**Brent M. Johnson,**
*Secretary, Department of Employment and Training.*

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Commonwealth of Virginia,
Department of Education.
*Richmond, September 19, 1983.*

Mr. Thomas F. Royals,
*The Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: You must excuse the length of time it has taken me to answer your request on my thoughts on apprenticeship.

I think that the status of apprenticeship today, at least in Virginia, is neutral. I have been in this position for some twelve or thirteen years and the total number of apprentices served each year hasn't varied more than four or five hundred from one year to the next.

I would hazard an opinion that apprenticeship is not growing as it should for several reasons. The first being that sources of revenue, national and state, are getting much tighter. Secondly, I would suggest that the public image of apprenticeship is not what it should be. And third, I would bring up the ugly word of turfism.

Let me elaborate on funding. First, I would refer you to the enclosed letter from Bob Glover, the recent chairperson of the Federal Committee on Apprenticeship. I can't help but think that he is precisely on target in the stand he has taken at the federal level. If apprenticeship had but a small portion of the funds that Manpower and CETA have had, I believe we would not have such trained craftsman needs today. I have always wondered why, when a training program is undertaken that the existing sources and resources for delivering this training or retraining are ignored and new systems of departments set up.

Another big problem in the satisfactory delivery system for apprenticeship training has been an overriding fear of someone treading on someone else's "turf".

There has been a feeling among those in the registration agencies that Vocational Education is (1) useful only in providing funding for Related Instruction and (2) is trying to take over the entire program because they (Vocational Education) feel they can do a better job.

Both of these precepts are wrong. Vocational Education can and does work harmoniously with the registry agency in promoting the system. In Virginia, we have several full time local coordinators of Related Instruction that work closely with their apprenticeship representatives in developing new programs. In one area of the Commonwealth they have assisted the apprenticeship representative in registering over 200 apprentices in the past year that probably would not have been registered without this cooperation.

While "taking over" the system may have been in some Vocational Educations' minds years ago, I doubt if anyone now in Vocational Education gives this any serious thought. The Vocational Educators I know and work with all want to know more about the system, how it works, and how it can "mesh" with their programs and benefit their "products". If Vocational Education were admitted to the Apprenticeship System as a full partner, rather than continually being a "step child", the system would improve and prosper.

I really don't see much hope for apprenticeship in the foreseeable future without a major image change. Many industries perception of apprenticeship is negative. I think this is because the word "union" has been closely associated with apprenticeship and all its aspects for a long, long, time. It's true that some of the most satisfactory delivery systems of apprenticeship training in this country have been through the JAC's, the cooperative accommodation between labor union and a group of contractor sponsors, particularly in the construction trades. It's an excellent system and develops some fine journeymen. However, there are just as many non-union independent apprenticeship programs that also do a good job. I think that this is the major problem that apprenticeship faces in this country for the foreseeable future. Solving the problem will take money and a very perceptive public relations program.

The philosophy that we have undertaken with regard to apprenticeship in Virginia is one of service. Vocational Education in Virginia is a contracting agency with the employer (sponsor) to provide the Related Studies that he, or she, the employer, deem necessary for satisfactory journeymen level performance. A great deal of time has been spent working with Vocational Educators explaining apprenticeship as it works in Virginia. More local directors and principals of area Vocational Centers are becoming knowledgeable about the program they (the students) are currently in as one involving the first two years of a six year program.

Now to the final part of your letter. You asked for some thoughts about the future of apprenticeship. Unless, or until, we, in apprenticeship, can make a positive image change, I don't think that apprenticeship has much more of a future than it has a present. It will just exist. I would hope that your committee would see fit to try and do something along these lines. I can, however, see a great deal of potential for apprenticeship in the future with a change in image.

I have mixed emotions about the role of the Department of Labor. I think that the Department of Labor has deliberately low rated apprenticeship so that it will not grow. However, I believe that if we are going to have an image change that this would probably be the most satisfactory place for it to come from since the states of localities are saddled with the expenses and efforts of operating the programs. Perhaps the Federal Committee could work toward the development of (1) an examplary public image, and (2) the minimizing of turfism. Perhaps a good place to start would be in emphasizing apprenticeship in the JTPA Programs nationwide.

I would hope that this response to your letter is adequate and relevant to the questions you raised to me in your request. If you have any questions, feel free to respond either with a phone call or by letter. My phone number is (804) 225-2090.

Cordially yours,

H. P. Allyn,
*State Supervisor,*
*Apprenticeship Related Studies.*

Enclosure.

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U.S. Department of Labor Memorandum

Employment and Training Administration,
*Washington, D.C.*, August 6, 1982.

To Members of the Federal Committee on Apprenticeship and Others Interested in Apprenticeship.
From Bob Glover, Chairperson.

The Department of Labor's neglect of apprenticeship and the Federal Committee on Apprenticeship has reached such a high level that I feel it ludicrous to continue to serve as chairperson of the Committee. Attached you will find a copy of my letter of resignation to Secretary Donovan.

It is with sadness that I am taking this action, not only because I see so much unrealized potential in the FCA but also because I have treasured working with so many dedicated individuals on the Committee and in the apprenticeship community. I shall greatly miss you.

Having served as chairperson of the Federal Committee on Apprenticeship for the past four years, I am convinced that it is essential to have a stronger national focus for apprenticeship representing the interests of apprentices, workers and employers and the public across all apprenticeable trades. Stronger national leadership is in the interest of apprenticeship both at the state and local level as well as the federal level. Further such a national coalition cannot be as dependent on the Department of Labor as the FCA now is. Is it feasible to have a Federal Committee on Apprenticeship independently organized and privately financed and staffed? If so, how? Can such a national apprenticeship coalition be built and maintained without total Labor Department sponsorship? These questions merit serious consideration from the apprenticeship community.

I plan to continue writing and researching apprenticeship issues. (I think apprenticeship is in my blood!) I hope many of our paths will cross again in the future.

U.S. Department of Labor,
Employment and Training Administration,
*Washington, D.C., August 6, 1982.*

Hon. Raymond J. Donovan,
*Secretary of Labor, U.S. Department of Labor,*
*Washington, D.C.*

Dear Secretary Donovan: I am writing you to resign from my position as Chairperson of the Federal Committee on Apprenticeship. I am taking this action to protest the abysmal record of your administration regarding apprenticeship training.

Due to disinterest, inactivity and neglect on the part of your administration, the Federal Committee on apprenticeship has become no more than a facade and I can no longer tolerate the frustration of serving as chairperson. For more than six months from September 1981 to April 1982, almost half of the memberships on the committee remained vacant awaiting your appointment of new members. More than a year ago, the budget for the committee was eliminated and the committee has remained in financial limbo ever since. Finally, on July 1, 1982 the charter for the committee lapsed—not because of any conscious decision within the Department but because the charter renewal papers have taken an extraordinarily lengthy time moving through the chain of command within the Employment and Training Administration.

Twenty-two of twenty-five members of the Federal Committee on Apprenticeship are representatives of the private sector and by charter the Committee reports to the Secretary of Labor. It is ironic that at the same time that the Department of Labor has been promoting greater public-private cooperation and urging local CETA prime sponsors to work with Private Industry Councils, the Office of the Sceretary of Labor has been incapable of working effectively with its own private sector advisory group.

Most regrettably, such ineffectiveness in working with the Committee is missed potential. The members of the Federal Committee offer to your office a huge wealth of knowledge and experience in training and an enthusiastic resource interested in working with you. Your early policy statements emphasizing your concern for promoting training rather than income maintenance programs encouraged several committee members; but unfortunately, in the apprenticeship area, your actions have failed to match your rhetoric.

Curiously, relative to other training activities of the Department, it would take little time or funding to give a major boost to appenticeship. Such a move could have a large effect because any public dollars would be multiplied and extended manyfold by private efforts and funds. American apprenticeship is primarily a voluntary privately sponsored and privately financed institution and will remain so. But precisely because it receives so few public dollars, it also receives little attention from Labor Department officials.

The bald truth is that after more than a year and a half into this administration, the Department of Labor has not achieved any positive accomplishments in apprenticeship training. Indeed there is only a litany of losses for apprenticeship. You have all but wiped out almost every funded activity in the Department affecting apprenticeship including Apprenticeship Information Centers and Targeted Outreach Programs. These cuts of programs aimed at women and minorities not only reduce availability of information regarding apprenticeship but also make it likely that fewer women and minority men will be trained through apprenticeship. Apprenticeship New Initiatives contracts which promoted new apprenticeships and demonstrated that apprenticeship training could be linked with vocational eduction in high school were also cut. All of these cuts were made across the board without respect to program performance.

Even the GATB testing service traditionally offered to apprenticeship sponsors by Job Service offices has a questionable future. Your attempted revisions of the Davis-Bacon Act would have undermined apprenticeship in the construction industry and replaced apprentices with helpers for whom there is no training requirement. All sponsored research on apprenticeship has been closed down except one project which itself has been badly mismanaged by the Department. The Department has even eliminated the state and national apprenticeship data system so that the only information on numbers of apprentices is now collected through an inferior data system operated by the EEOC.

Department officials have talked of decentralizing apprenticeship administration to the states without any consideration of implications of such a move nor any coherent plan for how that might be accomplished constructively. Strengthening apprenticeship at the state level is a worthy goal but difficult issues remain to be worked out and some important national roles will remain. For example, some minimal national standards need to be met. In our highly mobile society, transferability of skills is important. An ironworker trained in North Dakota ought to be prepared and able to work at the same trade in California.

The Employment and Training Administration recently has been reorganized demoting the Bureau of Apprenticeship and Training to the bottom of the organization chart and inserting two to three additional layers of bureaucracy between the Bureau and the Assistant Secretary. Large numbers of staff vacancies including positions for state and regional directors have remained unfilled. BAT staff have been decimated by reduction-in-force notices and remaining workers have lived under constant threat of furlough or future layoff. It is difficult to imagine a worse environment for accomplishing anything constructive. Personnel cuts are likely to lead to fewer registered apprentices.

If apprenticeship is to help meet the nation's need for increased skill training, the number of apprenticeship training places must be significantly expanded and the orphan status that apprenticeship now endures in the Labor Department must be eliminated.

Perhaps most of all, we must come to realize that training is indeed a joint enterprize deserving and demanding the close cooperation of both the private and public sectors. Further, it is a joint venture that strongly influences our nation's defense capabilities, productivity, economy and trade position in world markets.

I urge you to reconsider the apparent low priority you have placed on apprenticeship and the work of the Federal Committee on Apprenticeship. I hope you will work cooperatively with the next Chairperson of the committee.

Sincerely,

ROBERT W. GLOVER,
*Chairperson,*
*Federal Committee on Apprenticeship.*

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STATE OF FLORIDA,
DEPARTMENT OF LABOR AND EMPLOYMENT SECURITY,
*Tallahassee, Fla., October 24, 1983.*

Hon. JOHN N. ERLENBORN,
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR CONGRESSMAN ERLENBORN: Having been directly involved in Florida as the Secretary of the Department of Labor and Employment Security, and as a participant in the NAGLO, NAP, and NASTAD meetings, I am convinced that one of the major factors contributing to the problems now facing America's industry is the degeneration of the National Apprenticeship Program of this Nation.

It is vital to us, as a people, to ensure that the highly skilled work force of this nation *does not* disappear, that we preserve and expand it. In order to accomplish this, a serious look must be taken at the Federal Bureau of Apprenticeship and Training and the individual State Apprenticeship Bureaus.

The Federal Bureau of Apprenticeship and Training has reached a low ebb, and it is imperative that the Bureau be reassessed. There is no question in my mind of the need for the services of the Bureau to the states and the apprenticeship community. However, it is impossible for that agency to accomplish the mission given it by the Fitzgerald Act, if it is not funded or staffed properly. The Bureau is *now* located in, and should remain in, the Department of Labor. This is necessary, due to the fact that wages, hours, and working conditions are the responsibilities of the Department of Labor. Subsequently, the Bureau of Apprenticeship and Training is responsible for the welfare of the apprentices, i.e wage scales, hours, and working conditions.

The Bureau of Apprenticeship and Training and the Florida Bureau of Apprenticeship have an excellent relationship and we have accomplished much. However, there are many opportunities for apprenticeship being lost due to lack of personnel, funds, and promotional material. These should be considered and serious consideration should be given to supplemental funding for the states which now have apprenticeship bureaus. I know there are many concerns and problems facing the apprenticeship program, but we must take first things and start with rebuilding a firm foundation from Washington.

I am sincerely interested in seeing the National Program become revitalized, viable and operating as it should, and believe the hearings should be held this fall on the National Apprenticeship Program.

Anything you can do to help will be appreciated.
Cordially yours,

WALLACE E. ORR, *Secretary.*

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STATE OF FLORIDA,
DEPARTMENT OF LABOR AND EMPLOYMENT SECURITY,
*Tallahassee, Fla., September 22, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: In Florida, which has traditionally been one of the leading states in apprenticeship, we are feeling the effects of the recession. In relationship to apprenticeship that means a drop in the number of registered apprentices and programs. However, we are optimistic and feel that in the future the demand will be greater.

At present the majority of the registered apprentices, not only in Florida, but nationwide, are in the construction industry. We are making attempts, somewhat successfully, to expand the program to nontraditional occupations now, and plan to make more of a concerted effort in the future. That expansion includes the prison system, government, etc.

I feel very strongly that the Committee on Education and Labor should consider the problems of the Federal Bureau of Apprenticeship and Training; e.g., funds, staffing. Consideration should be given by the U.S. Department of Labor to some support funding for the State Apprenticeship Council states. A national effort on the part of the federal government to promote, in every state of the union, the concept of the apprenticeship system should be made.

I am vitally interested in the structured, formalized apprenticeship system for our young people of this state. It is the "workingman's college" and deserves assistance and recognition. Additionally it has proved itself over and over again to be an excellent means by which minorities and females may reach their potential, become a supporter of both family and government. Thus I, as Secretary, am personally committed, as is the Department of Labor and Employment Security, to the promotion and development of the Apprenticeship Program in Florida.

Please feel free to call me for any assistance I may give.
Cordially yours,

WALLACE E. ORR, *Secretary.*

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STATE OF FLORIDA,
DEPARTMENT OF EDUCATION,
*Tallahassee, October 11, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: First, let me thank you for the opportunity to provide input to the Congressional hearings on the American Apprenticeship System from the Vocational Education perspective. The hearings are timely and I am confident that they will have a positive effect on our skilled labor force at a time that our whole industrial thrust appears to be in a period of transition.

My comments are intended to be representative of our national apprenticeship system, although I have drawn upon experience I have encountered in my duties as the Florida Director of Vocational Education. I realize that the committee hearings on this important matter will be severely limited in available time and I have restricted my comments to those areas in which I consider priority items.

The national apprenticeship effort over the years is being de-emphasized, as evidenced by the reduction in funding for the Bureau of Apprenticeship and Training. It is suggested that the National Bureau of Apprenticeship and Training be considered for:

(1) Elevation to a higher level of government organization.

(2) Removal from direction of the Department of Labor.

(3) Appropriate staffing and funding commensurate with its relative national contribution to a skilled labor force.

Partial federal funding should be considered for specific support of apprenticeship activities by state apprenticeship bureaus and councils, and for state educational pre-apprenticeship and apprenticeship related instruction.

In view of the voluntary nature of apprenticeship and its financial burden being borne primarily by industry, tax incentives would appear to be one method of improving and increasing industrial participation in apprenticeship.

Research has shown a general lack of knowledge of how apprenticeship training occurs (Wells, 1982). A multi-prong public enlightenment campaign should be considered from the highest levels of government; a campaign spearheaded by the Department of Education and Labor. This publicity effort might be associated with a national apprenticeship week and carried forward thoughout the years.

The preparation of our young citizens for career choices has been limited to college orientation or other educational disciplines supplemented with vocational courses. An effort should be made during the early school years to improve the image of the vocational student and the apprentice. These routes of training should be viable career alternatives. Perhaps we could look to lessons learned in other countries.

This committee might consider further hearings as early as practical. It is suggested that the new hearings be expanded both in time and in scope, permitting working groups, made up of a cross-secton of the national apprenticeship community, to explore apprenticeship in depth. This committee could provide direction for our national effort.

Our interest in apprenticeship in Florida is sincere and I am optimistic that my comments will contribute to the undertakings of this committee hearing. Please call or write if I or my staff can be of further assistance.

Sincerely,

JOE D. MILLS,
*President, American Vocational Association.*

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STATE OF FLORIDA,
DEPARTMENT OF LABOR AND EMPLOYMENT SECURITY,
*Tallahassee, Fla., September 1, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: Responding to your request for comments in your letter dated August 18, 1983, I will try to be brief.

The status of the apprenticeship program both in Florida and nationwide leaves something to be desired in that we are and have been focusing the majority of our attention on the construction trades. Need I say that we, meaning the apprenticeship community, are saturated with construction programs. This, in itself, is as it should be; however, apprenticeship should not be only primarily associated with construction.

The building trades programs have served us well and we should be very proud of that fact. They have supplied this nation with highly skilled craftsmen, and even though at present new and different channels of thought regarding the operation of a given program are being tried, I'm sure that the true, pure and tried methods of apprenticeship will survive. In fact, they must if this nation is to survive. After all, a skilled labor force is the very first line of defense of any nation.

As to the future of apprenticeship, as I said before, new and different concepts and methods are coming. We, as a people, should not blindly close our minds, but rather explore the merits of such. There are many apprenticeable occupations; many employers when once the value of the apprenticeship system is brought to light and understood, would be willing to develop and have registered apprenticeship programs.

Apprenticeship is a continuation of the learning process; a means of developing skilled labor. It is 96 percent on-the-job training and four percent related instruction. Its credibility is unquestioned, but sadly enough its importance to this nation is not realized, I repeat, is not realized, promoted, nor given the recognition it so justly deserves by our nation's leaders.

The Committee on Education and Labor should indeed focus their attention on the role of business, industry, labor unions and lastly educational support for related instruction in the national program. The federal bureau of apprenticeship should be revamped; support of the S.A.C. states in the form of funds for the state bureaus of apprenticeship should be considered. This nation, in order to regain our strength and place in the world as the Number One industrial nation must address, support, and promote the apprenticeship system.

Sincerely,

Richard Y. McCauley,
*Chief, Florida Bureau of Apprenticeship.*

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State of Florida,
Department of Labor and Employment Security,
*Orlando, Fla., October 25, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: I am an apprenticeship representative for the State of Florida, located in Orlando. Information reveals that you are the person to communicate with concerning apprenticeship activities that the Committee on Education and Labor will be considering in November.

A situation exists of which the committee should be aware.

The Bureau of Apprenticeship is in the Department of Labor on a national level and in most states. Education, on the other hand, is in another department, usually the Education Department.

Herein lies a problem as I see it. Education is always talked about and glorified by government officials and the news media to the point that education most always ends up receiving necessary monies to carry on their functions.

Apprenticeship on the other hand is directly associated with labor and does not get the credit it most assuredly deserves as an educational function.

More people have been trained through the apprenticeship system than all other processes combined since its inception before Christ. It has proven by the test of time to be one of the best ways (probably the best) to train a person to do a job, yet it gets very little support from Government (financially) to carry on its functions.

I think the committee should study and take a good look at the benefits that apprenticeship provides this nation and properly consider funding it sufficiently to get the job done.

I understand that amendments to the National Apprenticeship Act have been submitted. Please call this to the attention of the Committee on Education and Labor and ask them to seriously consider the amendments for the life of a great training system.

Sincerely,

W. E. Livengood,
*Apprenticeship District Program Manager.*

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Public Service Co. of New Mexico,
*Albuquerque, N. Mex., October 25, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: Public Service Company of New Mexico has long been a supporter of the apprenticeship system. We registered our first program with the New Mexico Apprenticeship Council in September of 1952, in cooperation with the Bureau of Apprenticeship and Training, U.S. Department of Labor. Today, we have 16 different crafts registered.

The apprenticeship training program is administered by a joint union-mangement committee and by a management person in the training department. The General Apprenticeship Committee (GAC) appoints subcommittees in various locations of the Company to monitor the program in their area and to make recommendations to the GAC for action.

For the last several years, the apprenticeship program has constituted approximately ten percent of the total employment at PNM, with roughly 250 apprentices in the program at this time as in 1982. We register from 50 to 60 apprentices yearly and graduate approximately 50.

We believe that apprenticeship training has proven itself over the years and continues to be the best form of training to provide a qualified and productive work force.

As this country zeros in on the productivity issue and the education and training factors are closely scrutinized, I predict that the apprenticeship approach will emerge as the winner.

Sincerely,

J. D. GEIST,
*Chairman and President.*

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STATE OF WASHINGTON,
DEPARTMENT OF LABOR AND INDUSTRIES,
*Olympia, Wash., September 22, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: I am pleased to be informed that the House Committee on Education and Labor will be reviewing means for strengthening the National Apprenticeship Progran. The washington State Apprenticeship Program was recently reviewed and evaluated by both houses of our state legislature. The results of that evaluation underscore the fact that here, in Washington, State, apprenticeship training is not only viewed as a vital and cost effective method of employment training but also a legitimate public policy concern at the state level. It should be no less of an interest to the federal government.

In your August 29, 1983 letter, you correctly identified that a successful national and state apprenticeship program must have strong linkages to business and industry, employee and employer associations, and to the educational systems. Since the apprenticeship method of training is formulated to meet both the present and future skill needs of employers and employees, its strenghtening would be a positive step toward ensuring that skilled workers are available to meet industry's future needs.

Frankly, the recent state of apprenticeship has been stagnant. There are several reasons for this. First, and foremost, there has been a lack of government involvement in economic development planning. Employment and training policies and programs are a critical component of economic development. Service programs, such as apprenticeship and training, which are directed at the on-going and future needs of the private sector are often placed on the fiscal and programatic back-burner. Obviously, government must respond to immediate critical needs of citizens. The basic services and benefits which preserve a quality of life, such as medical, retirement and income maintenance programs, must continue to be funded. However, government policies and programs which address the future employment and training needs of business, industry and employees are only now receiving attention.

Secondly, the national and many state apprenticeship programs have found themselves reduced to playing a bureaucratic numbers game rather than providing service. In the politics of the budgetary process, numbers of programs and apprentices count for more than quality of service and involvement and training in planning and ensuring sound economic development.

Lastly, apprenticeship and training has failed to include all the necessary constituencies to achieve program growth and adaptability to a changing national and international economic environment. All too often, the national and various state programs fail to establish program linkages to all affected constituent groups.

The Washington State Apprenticeship and Training Program has initiated a serious effort to participate in state economic and human resource planning. The Aprenticeship and Training Program has re-defined 'its business' on an intergovernmental and interagency level. Since modern apprenticeship training inherently involves a partnership between industry, labor and government, the Washington State Apprenticeship Program has adopted a facilitating role to better coordinate the delivery of available technical assistance to program sponsors. To accomplish this objective, our apprenticeship program has established linkages between itself and relevant state and local economic development, employment training and educational agencies at the policy-making and service delivery levels.

The Washington State Apprenticeship Program has adopted a long-range plan to expand apprenticeship to new industries and occupations. Our state program has given a high priority to reviewing and enhancing the quality of registered programs.

In order to achieve these goals, our state program found it necessary to reorganize its staffing patterns. New supervisory positions were created to ensure uniform, consistent and timely application of apprenticeship policy throughout the state. A new staff position was created and charged with maintaining close interagency, intergovernmental and constituent group relations in the development of new apprenticeship programs.

The membership of the Washington State Apprenticeship and Training Council also reflects our state's redirection of apprenticeship. The Washington State Apprenticeship Act has been amended to add a public member, appointed by the Governor and confirmed by the Senate, in addition to the existing employee and employer representatives.

At the present time, the majority of registered apprentices are indentured into programs in the construction industry. Any discussion concerning the future of apprenticeship must anticipate that this will also be the case in the near and intermediate future. Apprenticeship programs in the building and construction trades have been and will continue to be vital to the health of the national economy. Construction industry programs are affected by technological change, as are other sectors of the economy. The successful application of new materials, tools and construction techniques depends upon the existence of a quality work force. The national and individual state apprenticeship programs should continue their awareness as to the service needs of these programs particularly in terms of quality applicants, related instruction requirements and new work processes.

There will be, however, new opportunities for apprenticeship training in newly emerging industries and occupations. In service industries, such as health care, and in the development of technologically advanced products, there is a potential for program growth. This will require that the national and individual state apprenticeship programs undertake a serious effort to understand the special training requirements of each potential program sponsor and deliver whatever array of services are available to meet those indentified needs.

Of course, no review of apprenticeship would be complete without discussions of federal and state roles. A distinction should be made between overall national apprenticeship needs and the special role of the Bureau of Apprenticeship and Training (BAT) U.S. Department of Labor, in states without a state apprenticeship council.

In my opinion, the entire national apprenticeship system would benefit from nationally sponsored research in program development. This would include identifying emerging apprenticesable occupations, development of related instructional materials and teaching guides for apprenticeship instructors. Furthermore, the BAT could be of great service in disseminating case study information on successful program development efforts throughout the nation.

The BAT should consider redeployment of personnel to those states without State Approving Councils. It is imperative that these states receive the level technical assistance necessary to preserve and expand apprenticeship training opportunities. In states with State Approving Councils and adequate staffing, the federal government should maintain a level of effort necessary to disseminate national apprenticeship research, provide liaison services to state agency directors and monitor state efforts to assure compliance with affirmative action in apprenticeship. Activities pursued in addition to those just mentioned are largely duplicative of state-level resources and efforts.

Sincerely,

G. DAVID HUTCHINS,
*Assistant Director,*
*Apprenticeship Section ESAC Division.*

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APPRENTICESHIP AND TRAINING,
CARPENTERS LOCAL UNION 210,
*Norwalk, Conn., September 22, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: I am responding to your letter of August 18th, 1983 relative to my opinion of the status of apprenticeship and its future.

As you no doubt know, the recession has upset the continuity of apprenticeship in many of our industrial plants, thus reducing the need for large volume of training. In 1957, I recommended to the President, Michael Svirdoff, Connecticut State Labor Council, for the need of an expanded increase in training for machine tool apprentices, as Connecticut faced a drastic shortage of skilled manpower. I stated that unless we continue to train at least 1500 to 2000 machine tool apprentices each year, many of the Connecticut Industries would lose out to other areas of the country and to foreign production; (two major firms in the Hartford area) Underwood Typewriter Company to Italy, the Royal Typewriter Company to England.

In similar cases the Silver Industry, the heavy machine tool firms likewise have suffered extensive setbacks because of competition building up in the other areas of America and overseas.

We, in turn, reverted to extensive use of Federal Contracts under M.D.T.A.-C.E.T.A. and other manpower programs to absorb the youth of the state in skills training programs.

My recommendation to Dr. Garth Mangum, author of the Manpower and Development and Training Act who accept nine points, recommended by my office, one of which was to enable Labor Market areas to project potential manpower needs, especially in the skilled areas.

Surveys conducted throughout Connecticut during 1962-63, projected our confirmed skilled workers needed. In turn, I, as Manpower Director, organized Pre-Apprenticeships Programs to give potential candidates basic orientation in the several skills involved. All candidates were then referred on to firms interested and entered into employment opportunities in many skilled employment areas available at the time.

These programs proved most beneficial in preparing minorities in skill training programs leading to full apprenticeship status.

Carpenters L.U. 210 presently has 209 carpenter apprentices employed through the Western Connecticut area Carpenters Labor-Management Committee. We have 18 female appentices and 47 Black and Hispanic apprentices in the skilled manpower areas.

This JATC has utilized the Pre-Apprenticeship Orientation Program since 1962 with a total of 62% retention and completion of training.

With the success of this program, I delivered the group of mixed apprentice candidates, all ethnic applicants, for training and membership. The International Union adapted Pre-Apprenticeship recommendations and pursued contracts with the U.S. Labor Dept.

Incidentally, the first fifteen programs registered and approved in Washington, D.C. under M.D.T.A. were programs developed and submitted by my office in the State Apprenticeship Council.

I strongly recommend that programs be organized, after a manpower survey need is conducted thus preparing the youth of the community for entry into a Bona-Fide apprenticeship program. Our JATC has waived high school entry requirements, and accepts all candidates 17 years of age and over into training.

Our most recent class established by our own JATC is with the Conn. State Technical College here in Norwalk, leading to college level credits, in the field of Architecture studies, leading to a superintendent position with construction firms.

I would be pleased to meet with you in person in order to give you detailed explanation of how this JATC works with each apprentice to prepare them and pursue them in all phases of the carpentry trade.

Should your people be interested, please advise me. My telephone number is (203) 853-6022.

Sincerely,

THOMAS YOCZIK, *Consultant.*

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NEW MEXICO LABOR AND INDUSTRIAL COMMISSION,
*Santa Fe, N. Mex., October 18, 1983.*

Hon. JOHN N. ERLENBORN,
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR CONGRESSMAN ERLENBORN: It is my understanding that the oversight hearings on the Federal Apprenticeship Program are now scheduled to be held on November 9th and 10th.

I have also heard that there is a possibility that strong opposition to hold the oversight hearings may develop. This possibility, if it is in fact a possibility, greatly disturbs me. I feel that apprenticeship is the most effective and cost-efficient method of training ever devised, and needs the support of concerned members of Congressmen such as yourself to help assure that it is given more support at the national level. It is my hope that the oversight hearings will be held as I feel confident that testimony which will be given during these hearings will be of great assistance in reversing the present trend toward placing less importance on this training system.

I firmly believe if this trend is allowed to continue, the consumers in this nation, as well as the workers who produce our goods and services, will suffer as a result if a more poor quality of goods and services caused by workers who are nearly so well trained as they have been had they completed a good apprenticeship program.

I respectfully request that you use your influence in every way to cause these oversight hearings to be held.

Very truly yours,

**Frank B. Smith,**
*Labor Commissioner.*

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New Mexico
State Labor and Industrial Commission,
*Santa Fe, N. Mex., September 15, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Sir: In response to your recent letter to me regarding hearings on the national apprenticeship program by the Committee on Education and Labor, this information is very encouraging to me. It also pleases me to learn that the Committee has a strong interest in seeing that the apprenticeship system is strengthen in this nation.

Our Apprenticeship Council Director, Mr. Wendell L. Boswell, has already responded to your letter, and I concur in his observations that the apprenticeship method of training is the most effective method ever conceived for training in those occupations for which it is best suited. I feel that it is very important that this training method be expanded into many occupations which have not traditionally used the system. In order to effectively accomplish this, I believe that incentives, perhaps initiated by Congress itself, will be needed.

I am confident that the hearings will result in many innovative ideas on how to best expand the system. I wish to express my appreciation for the interest the Committee is taking, and hopefully new enthusiasm can be generated which will cause renewed interest in this excellent training system. If our agency can be of any assistance, please let me know.

Very truly yours,

R. C. Brooks,
*Labor Commissioner, State of New Mexico.*

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New Mexico State Apprenticeship Council,
*Albuquerque, N. Mex., August 30, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: Thank you for your letter of August 18, 1983, informing me of the proposed hearings on the national apprenticeship program this autumn.

I have just read the minutes of the Annual Conference of the National Association of State and Territorial Apprenticeship Directors (NASTAD), a conference which I was unable to attend. That association intends to cooperate fully with the hearings. I am very pleased to learn of the interest in apprenticeship being demonstrated by the Committee.

I am not going to write a long dissertation on apprenticeship, as I'm sure that you are going to receive many position papers on the subject. My main concern is that the apprenticeship method of training be much more widely recognized for what it is, the most cost-efficient, viable, effective, and positive training method that exists when utilized correctly. Obviously, more incentives are needed to cause more employers to become interested in the system and to give it a chance in their businesses, etc., and thereby it will prove itself. Of course, more promotional material, a better "selling job" and more personnel to do the "selling" are badly needed in my opinion and all this takes money. When we take a look at the increasing proliferation of foreign made goods in our stores, spending more money to train our own citizens to become more productive and thereby making our own industries more competitive makes a tremendous amount of sense to me. I honestly believe if we don't do this, we as a nation will suffer the consequences even more than we are already.

The fact that in occupations for which apprenticeship is applicable, the apprentice earns as he/she learns, and learns by actually performing on the job, causes the system to be so effective, and cost less, in my opinion, than any other training system that could be used in the same situation.

Again, I appreciate the interest of the Committee, and hopefully some very positive results will be achieved as a consequence of the hearings.

Very truly yours,

R. C. Brooks,
*Labor Commissioner.*
(By: Wendell L. Boswell,
Manager V, Director of Apprenticeship).

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U.S. Department of Labor,
Employment and Training Administration,
*Columbus, Ohio, October 21, 1983.*

To Tom Royals.
From Daniel T. McCarthy, State Director.
Subject input for hearing on apprenticeship per our discussion.

A certified national apprenticeship training program within American industries is of vital important to this nation as a whole. The nation can only be as strong militarily and economically as the skilled labor force within it.

Within the past few decades, the emphasis on broad training to include exposure to all aspects of a skilled trade has been somewhat diminished in favor of specialized training geared only towards segments of recognized trades. The industrial strength of this country was built through the innovation and experimentation of skilled workers who were well-versed in all aspects of their particular trade. Through lack of interest on the part of industry to perpetuate the thinking and the ideas of highly skilled craftsmen, the country has lost through attrition and deaths the expertise of these people that only years of experience can develop. We must recapture those abilities through universally structured apprenticeship training programs if we expect any degree of mobilization from our industries in the event of a national emergency.

The registration of a skilled trades program is the only present means of identifying the availability of not only companies with the ability to train full-fledged mechanics but, also, where the sources of skilled workers can be found. This information is accumulated by the Bureau of Apprenticeship and Training and available to all agencies with a need for that statistical data.

The Bureau, through their staff and the staff of the State Apprenticeship Councils, has developed in-plant and area apprenticeship committees, some which have joint (labor) representation, to assure adherence to minimum criteria for the skilled trades programs which number over 700. This includes all skilled occupational classifications including construction, manufacturing, service, graphic arts, etc. It is this government structure (BAT) that identifies not only companies that are capable of training skilled workers but, also, those that are presently active in formal registered programs.

The Office of Research and Development has sponsored grants for technical reports on not only the need for formal apprenticeship programs in this country but, also, reports on apprenticeship in foreign countries, i.e., Research and Development Grant No. 20-36-79-01 on Apprenticeship in Foreign Countries. A few suggestions from this report (Page 66) included:

(1) Through Federal-State action, coordinate apprenticeship and vocational education. This would involve the acceptance of approved vocational education as a substitute for a portion of or a coordinate part of apprenticeship. It, also, would include standardized proficiency examinations in occupational skills without regard to the type of training.

(2) The Bureau of Apprenticeship and Training in the Department of Labor should be strengthened in staff and functions with the ultimate objective of declaring that the supervision of vocational training of any kind is a federal function while the states retain control over education.

In most of the reports developed through research grants of this type, suggestions of monetary assistance to employers who train through certified apprenticeship programs are recommended.

If monetary considerations cannot be implemented, it would then seem reasonable that policies or legislation regarding certified apprenticeship programs be adopted that would apply to all government contractors. This would assure the country of industrial efforts to perpetuate skilled workers in all the vital skilled trade occupations through registered apprenticeship programs.

The need for responsible action is evidenced even more today when, during periods of high unemployment and bitter competition, industry is still searching for skilled help and is unable to find it. Policies, legislation, rules, or economic methods of motivating industry to train skilled workers through apprenticeship appear to be in order. Only in this manner can we be assured that skilled training will be accomplished by using our entire potential of trainers rather than through the efforts of a few volunteers who presently shoulder the entire burden.

Best regards.

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Department of Labor,
State of North Carolina,
*Raleigh, North Carolina,*
*September 1, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: It is the position of the North Carolina Department of Labor that we should have a formal written agreement with the Service Delivery Areas (SDA's) in North Carolina. Following are the three reasons for our position:

(1) The Governor's Executive Order on Job Training Policy states: The Department of Labor is responsible for encuraging the development of certified apprenticeship programs in the State. It shall make best efforts to assure the following:

(*a*) That business and industries with apprenticeable trades are aware of the benefits of apprenticeship programs; and

(*b*) That apprenticeship programs are coordinated with available training resources to make them as effective as possible in meeting business and industry needs.

This requires, in our opinion, a formal written agreement to coordinate disbursement of the Job Training Partnership Act (JTPA) funds.

(2) The N.C. Department of Labor has been designated by the Secretary of Labor, U.S. Department of Labor, according to Federal Regulation CFR 29 29, as the registration agency for federal purposes. It is our belief, in the N.C. Department of Labor, that disbursement of JTPA funds is for federal purposes; therefore, if training is to be funded in apprenticeable occupations, it should be done in cooperation with the Apprenticeship agency with bonafide, registered apprenticeship programs, as a sign of good faith, similar to Davis-Bacon requirements on contractual work on construction job sites, etc.

(3) The North Carolina Department of Labor acts as the registration approval agency for veterans to receive benefits while thay are being trained in an apprenticeable occupation. Because veterans are a targeted group to receive assistance under JTPA, it is our belief again that we should have a formal written agreement establishing coordination of these activities with JTPA representative agencies.

Enclosed are copies of the Governor's Executive Order on Job Training Policy, and the letter and proposed agreement sent to SDA directors. I hope this will be of some benefit to you in what North Carolina is trying to establish for better utilization and disbursement of the JTPA funds in our State.

We currently plan to hold a public hearing October 10, 1983, from 9:00 to 12:00, on administrative rules governing apprenticeship programs and their operation in the State. I will send you a notice of the hearing and hope that you can attend.

Thank you for your assistance.

Sincerely yours,

Kenneth C. Pittman,
*Deputy Commissioner for Education and Training.*

Enclosure.

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Department of Labor,
State of North Carolina,
*Raleigh, North Carolina,*
*August 23, 1983.*

Dear ———: The North Carolina Department of Labor (NCDL) is looking forward to working with you in facilitating the coordination between your service delivery area (SDA) and the Department of Labor that is required under the Jobs Training Partnership Act (JTPA). We believe this coordination can be mutually beneficial and, more imprtantly, beneficial to the people receiving services in your SDA under JTPA. Since proper coordination between our organizations may best take place if the ground rules are laid out in a written agreement, we have taken the liberty of preparing sample language for such an agreement for your consideration. We also would look forward to meeting with you to discuss such an agreement and ways in which it may best be revised to meet the needs of your SDA.

We appreciate the positive manner in which all of the SDA's have approached the coordination issue and look forward to meeting with you in the near future.

Sincerely yours,

**Ken Pittman,**
*Deputy Commissioner for Education and Training.*
**John Crumpton,**
*Director of Apprenticeship.*

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The Austin Co.,
*Cleveland, Ohio, October 31, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Tom: One of the Austin offices has just responded to our internal survey on the National Apprenticeship Program.

Although arriving a bit late, I thought you would welcome the comments of Mr. James G. Peterson, construction manager of our Central District (Kansas City, MO).

His observations are specific, pragmatic and pertinent. I am transmitting them to you essentially as received.

Sincerely,

**Marvin M. Epstein,**
*Director, Marketing Services.*

Enclosure.

### National Apprenticeship Program

My observations of the National Apprenticeship Program as now conducted are as follows:

(1) It is very important to continue apprenticeship training, but improvements are needed to make the program more independent from the union segment. Classes need to be taught by professional teachers, with working tradesmen as assistants. A lot of what is taught amounts to union indoctrination, and in some cases those that get through the program do so because of the politics of union locals.

(2) A meaningful, structured, training program should be presented each night. Each meeting should be well planned, and the subject presented well. This would help prevent wasting the apprentices' time.

(3) More of the training should be done under the direction of management, not by just the unions.

(4) General subjects for all trades should be required—math, layout, safety, blueprint reading, etc.—before breaking into specific trades.

(5) The non-union segment should be included in the National Apprenticeship Program.

(6) Training for supervisory positions should be offered as well, such as courses on "Being a Foreman," etc.

(7) Progress in the program should be based on what is learned, rather than on the time spent.

The recommendations outlined in the Business Roundtable's "Government Limitations on Training Innovations" should be looked at closely for possible implementation.

Apprenticeship programs are important to the construction industry. They should be continued, but a revamping is important to get more for the money spent.

Georgia Department of Labor,
Employment Security Agency,
*Atlanta, September 12, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: I was pleased to learn that your Committee is to conduct hearings on the National Apprenticeship Program. The apprenticeship system of skill development can still be one of the most viable means of providing the skilled work force needed by a changing economy and to make young, inexperienced workers employable.

It has been difficult in the past, and even more difficult now, for young people entering the work force to learn about apprenticeship training opportunities and to get into the program.

In 1979, in recognition of this need for more information, the U.S. Department of Labor provided the funding for the operation of an Apprenticeship Information Center in Atlanta, Georgia to serve 15 metropolitan counties. The Center was operated by this department but after a period of two years the funds were no longer available and it was necessary to close the Center.

The Georgia Department of Labor employment offices located throughout the State have a limited amount of information on apprenticeship and they work with local apprenticeship committees but that is the extent of this Department's in volvement at this time.

It is realized that as many of our smoke-stack industries close and as we move away from an industrial economy to a so-called information economy, there may be relatively fewer traditional apprenticeable occupations. This, however, does not have to be the case. The apprenticeship concept could be extended into service industries as well as some of the newer fields dealing with data.

It is hoped that your hearings will result in a broadening of the apprenticeship concept, that is availability will be better known and that it will strengthen the relationship of the participating agencies and organizations both in the public and private sectors.

Sincerely,

Sam Caldwell,
*Commissioner of Labor.*

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North Dakota Department of Labor,
*Bismarck, N. Dak., September 14, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor, House of Representations, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: Thank you for permitting me to comment on the National Apprenticeship Program.

North Dakota does not have a state apprenticeship program. The Dept. of Labor operates the Bureau of Apprenticeship and Training (BAT) program in our state. The one representative is stationed in the Federal Building in Fargo. Prior to a year ago, the office was staffed by the director, one field representative and a secretary.

I feel very strongly that the office should have at least two full time positions. To travel from Fargo to some of the towns in the western part of the state, some 380 miles, requires two full days to complete a round trip.

We are experiencing a rapid growth of the power generating and gasification industry and the need for apprentices is increasing. Many new jobs are emerging from these industries and we want our workers to be able to fill these jobs rather than importing labor.

Recent nationwide reports are very critical of our secondary education system and the millions of students that came through the system ill-prepared to enter the labor force, while the apprenticeship program in this country has set standards that must be met before the trainee is recognized to be a journeyman. These standards are recognized nationwide and the worker can carry his skills across state lines.

This department has always supported the apprenticeship program because of its long history of success in our state. We fully support a continuous and strong apprenticeship program in this country, for the benefit of both our employers and workers.

The representative in North Dakota has maintained a close working relationship with this department, Job Service, Vocational Education and all other manpower agencies. He has kept us advised of the programs in progress and the outlook for the future.

We strongly recommend the continuation of the BAT in North Dakota and would like to see at least one additional staff person assigned to our state.

Another recommendation is that DOL, with BAT, develop an educational program directed to the American public as to the benefits of the apprenticeship program. In 1978 over 60 percent of the apprentices were employed in the construction industry. We feel that there are additional thousands of opportunities available in other industries.

Sincerely,

**ORVILLE W. HAGEN**, *Commissioner.*

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STATE OF WEST VIRGINIA,
THE DEPARTMENT OF LABOR,
*Charleston, September 19, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: In reference to your correspondence of August 29, 1983, in which you requested my comments on the most important issue of apprenticeship and training.

After careful consideration and investigation into the status of the apprenticeship program and its operation today, I must say that the West Virginia programs are operating far better than the surrounding states which have the state apprenticeship councils.

The Bureau of Apprenticeship Training, which is firmly entrenched in West Virginia, has and continues to do an outstanding job. We have an excellent working relationship between this department, BAT and the building and trades apprenticeship committees of our state.

West Virginia is the only state in the area, including the five surrounding states and the District of Columbia, that is fortunate enough not to have a state council. Our group of dedicated BAT individuals have given great support to our apprenticeship programs throughout the state.

As you can tell, we feel that a state apprenticeship council would not be a welcomed addition to us. When you have a machine in place that is doing an outstanding job you don't hinder it by taking any vital part out of it.

As for your question dealing with the future of apprenticeship training, I can only say that the past and present training has produced craftsmen of the highest caliber in West Virginia and as long as the cooperative climate exists between everyone the future is brighter than ever.

The federal government's role in apprenticeship and training programs would be greatly missed should the states be responsible for the administration of these programs.

Thank you for the opportunity of expressing these views on what I consider to be an extremely important issue.

If we may be of further assistance, please do not hesitate to contact this office.

Sincerely,

**LAWRENCE BARKER**, *Commissioner.*

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STATE OF HAWAII,
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS,
*Honolulu, Hawaii, September 15, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: Thank you for our letter of August 29, informing me of the planned hearings on the National Apprenticeship Program and for the opportunity to offer a few comments regarding the apprenticeship programs.

I'm sure that the hearings will bring forth the current status on apprenticeship and hopefully provide some positive support.

We have a state apprenticeship agency, and the administrator, Mr. Stanley Honda, is a member of the National Association of State and Territorial Apprenticeship Directors (NASTAD). We support any positive help toward a better apprenticeship.

Nationally, the apprenticeship program over the last several years has been steadily declining in many areas, noticeably in the total number of registered apprentices and registered programs.

A large portion of this decline is attributed to the downturn of the economy. The inability of employers to hire, due to economic reasons, obviously hampers the overall apprenticeship community because apprentice programs depend on employment and employment opportunities.

There has been national emphasis on other programs to help ease the high rate of unemployment, programs such as the Comprehensive Employment and Training Act (CETA) and the new Jobs Training Partnership Act (JTPA), jobs for veterans program, and other funding to help specific interest groups.

Yet, there has been very little help to rescue apprenticeship. Apprenticeship training has been for centuries the proven and preferred method of training. Nationally, there has been little support. The Federal Committee on Apprenticeship has been inactive for some time, and the Federal Bureau of Apprenticeship has been trying to survive with their limited budget.

The apprenticeship program throughout this country needs direction and leadership, especially during these times. The future of apprenticeship in part, requires the strong suport from the Federal government.

Sincerely,

JOSHUA C. AGSALUD,
*Director of Labor and Industrial Relations.*

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DEPARTMENT OF LABOR AND EMPLOYMENT,
OFFICE OF THE EXECUTIVE DIRECTOR,
*Denver, Colo., October 3, 1983.*

THOMAS F. ROYALS,
*Liasion Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: Thank you for the invitation to comment on the status of apprenticeship.

Apprenticeship is a long established, time tested and proven system of providing formalized training programs for the youth of our nation in the skilled trades. Apprenticeship is a cost effective training program as apprentices are employed workers and as such make significant contributions to the tax base along with training costs being borne by industry to meet their present and projected needs for a skilled work force.

Employers or employers and labor, where a bargaining agreement exists, sponsor and operate apprentice training programs in the local community which provide employment opportunities and skilled training for youth. The Colorado Apprenticeship Council assists program sponsors in developing formalized apprenticeship programs which are then registered along with their apprentices with the Council as the State's authorized apprenticeship registration agency. In Colorado, the State Board for Community Colleges and Occupational Education coordinates and/or provides the technical trade related instruction for apprentices.

Our state is one of thirty-three states and territories having state statutes or executive order establishing the state apprenticeship agency with full responsibility for the registration and administration of apprenticeship in the state. In such cases, the federal Bureau of Apprenticeship and Training (BAT) role is to serve as an arm of the state council and assist accordingly in line with the state rules, regulations, policies, and procedures. In states without a state apprenticeship agency, the BAT serves as the apprentice registration agency.

One of the BAT responsibilities under the provisions of the Fitzgerald Act which established them is to encourage and assist in the establishment of state apprenticeship councils. Additional budget for the BAT for extended emphasis in this area as well as budget to increase apprenticeship services would enhance the national and state apprenticeship agencies to better fulfill the important role they play in the skilled training of our nation's youth.

Sincerely,

RUBEN A. VALDEZ,
*Executive Director.*

Department of Labor and Employment,
Division of Labor, Apprenticeship Council Section,
*Denver, Colo., September 19, 1983.*

Mr. Thomas Royals,
*Liaison Officer, Committee On Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: Thank you for the opportunity to comment on the apprenticeship program scheduled for hearings before the Committee on Education and Labor.

Apprenticeship is the time-tested, cost effective method for training fully skilled workers. Thousands of large and small companies rely on apprenticeship to produce the well-trained journeymen to meet their needs for skilled workers to remain competitive. Apprenticeship develops skills which are marketable for a lifetime and industry bears the costs. Additionally, training is continually updated to accommodate constantly changing technology. Apprentices are part of a supervised, systematic, formally structured industry supported training program where they learn all the aspects of their trade.

I believe that the best course of action for our state and nation is to expand apprenticeship opportunities for our youth. Industry's continued commitment to the apprenticeship system insures that training will be comprehensive, timely and efficient. The highly skilled workers generated by this proven, established training system will benefit our nation, the apprentice and their families.

Employers or employers and labor, where a bargaining agreement exists, sponsor and operate apprentice training programs in the local community which provide employment opportunities and skilled training for youth. The Colorado Apprenticeship Council assists program sponsors in developing formalized apprenticeship programs which are then registered along with their apprentices with the Council as the State's authorized apprenticeship registration agency. In Colorado, the State Board For Community Colleges and Occupational Education coordinates and/or provides the technical trade related instruction for apprentices.

Colorado is one of thirty-three states and territories having state statutes or executive order establishing the state apprenticeship agency with full responsibility for the registration and administration of apprenticeship in the state. In such cases, the Federal Bureau of Apprenticeship and Training (BAT) role is to serve as an arm of the state council and assist accordingly in line with the state rules, regulations, policies, and procedures. In states without a state apprenticeship agency, the BAT serves as the apprentice registration agency.

One of the BAT responsibilities under the provisions of the Fitzgerald Act which established them is to encourage and assist in the establishment of state apprenticeship councils. Additional budget for BAT for extended emphasis in this area as well as budget to increase other apprenticeship activities would enhance the national apprenticeship program to better fulfill the important role they play in the skilled training of our nation's youth. Federal funds provided to newly established state apprenticeship agencies, at least for the initial start-up period, would encourage industry in the present non-council states to assume and accept responsibility for apprenticeship in their state where they are the most knowledgeable of their apprenticeship needs. They would also then establish apprenticeship policies, procedures, rules and regulations as determined by local needs and applicable to apprenticeship in the state where the training takes place.

If I can provide additional information, please feel free to contact me further.

Sincerely,

Keith O. Wiley,
*Director of Apprenticeship.*

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Apprenticeship and Training,
Carpenters Local Union 210,
*Norwalk, Conn., September 22, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: I am responding to your letter of August 18th, 1983 relative to my opinion of the status of apprenticeship and its future.

As you no doubt know, the recession has upset the continuity of apprenticeship in many of our industrial plants, thus reducing the need for large volume of training. In 1957, I recommended to the President, Michael Svirdoff, Connecticut State Labor Council, for the need of an expanded increase in training for machine tool apprentices, as Connecticut faced a drastic shortage of skilled manpower. I stated that unless we continue to train at least 1500 to 2000 machine tool apprentices each year, many of the Connecticut Industries would lose out to other areas of the country and to foreign production; (two major firms in the Hartford area) Underwood Typewriter Company to Italy, the Royal Typewriter Company to England.

In similar cases the Silver Industry, the heavy machine tool firms likewise have suffered extensive setbacks because of competition building up in the other areas of America and overseas.

We, in turn, reverted to extensive use of Federal Contracts under M.D.T.A.—C.E.T.A. and other manpower programs to absorb the youth of the state in skills training programs.

My recommendation to Dr. Garth Mangum, author of the Manpower and Development and Training Act to accept nine points, recommended by my office, one of which was to enable Labor Market areas to project potential manpower needs, especially in the skilled areas.

Surveys conducted throughout Connecticut during 1962–63, projected our confirmed skilled workers needed. In turn, I, as Manpower Director, organized Pre-Apprenticeships Programs to give potential candidates basic orientation in the several skills involved. All candidates were then referred on to firms interested and entered into employment opportunities in many skilled employment areas available at the time.

These programs proved most beneficial in preparing minorities in skill training programs leading to full apprenticeship status.

Carpenters L.U. 210 presently has 209 carpenter apprentices employed through the Western Connecticut area Carpenters Labor-Management Committee. We have 18 female apprentices and 47 Black and Hispanic apprentices in the skilled manpower areas.

This JATC has utilized the Pre-Apprenticeship Orientation Program since 1962 with a total of 62 percent retention and completion of training.

With the success of this program, I delivered the group of mixed apprentice candidates, all ethnic applicants, for training and membership. The International Union adapted Pre-Apprenticeship recommendations and pursued contracts with the U.S. Labor Dept.

Incidentally, the first fifteen programs registered and approved in Washington, D.C. under M.D.T.A. were programs developed and submitted by my office in the State Apprenticeship Council.

I strongly recommend that programs be organized, after a manpower survey need is conducted thus preparing the youth of the community for entry into a Bona-Fide apprenticeship program. Our JATC has waived high school entry requirements, and accepts all candidates 17 years of age and over into training.

Our most recent class established by our own JATC is with the Conn. State Technical College here in Norwalk, leading to college level credits, in the field of Architecture studies, leading to a superintendent position with construction firms.

I would be pleased to meet with you in person in order to give you detailed explanation of how this JATC works with each apprentice to prepare them and pursue them in all phases of the carpentry trade.

Should your people be interested, please advise me. My telephone number is (203) 853-6022.

Sincerely,

THOMAS YOCZIK, *Consultant.*

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TEXAS EDUCATION AGENCY,
*Austin, Tex., August 24, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: Thank you for allowing me the opportunity to comment on the status of apprenticeship in Texas today. I sincerely hope that what I am about to say will reach, in some manner, the committee.

Apprenticeship programs in Texas are probably doing the same as in most other states. The ones that are well organized, union or non-union, continue to operate at a steady pace. Due to the depletion of our Bureau of Apprenticeship and Training (BAT) staff in Texas, many programs are not being serviced at the minimum level and many prospective programs never get developed.

Texas does not have a State Apprenticeship Council (SAC) to do some of the work currently being abandoned by the BAT. The Texas apprenticeship system is administered through the Texas Education Agency (TEA). The Apprenticeship and Training Advisory Committee (ATAC) acts as an advisory group to the State Board of Education. The ATAC makes recommendations for funding, administrative procedures, and other concerns pertaining to our apprenticeship system.

Apprenticeship selections and curriculum development are done by each apprenticeship committee. The TEA will assist, upon request, in developing curriculum and training new apprentice instructors.

The real development of apprenticeship programs is done by the BAT. The certification and registration process is very important to us in Texas because, in accordance with out state law, no funds will flow to unregistered programs and/or apprentices.

We would like to know what direction we should take to ensure that our apprenticeship system will continue to meet the ever changing demands of our nations work force. In short, should we begin to develop our own State Apprenticeship Council for the purpose of development and registration or can we expect the BAT to provide the state of Texas with adequate representation.

My father was a BAT representative for twenty years before his retirement almost two years ago. I understand, as well as anyone in this state, why our BAT staff has dwindled down to almost nothing. We, in Texas, would rather have our old dependable system than try to re-invent the wheel.

Please accept this letter as a personal response and not necessarily reflective of all concerned parties.

Sincerely,

DAN LOWE,
*Coordinator, Apprenticeship and Training Program Support Services, Occupational Education and Technology.*

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DES MOINES PUBLIC SCHOOLS,
SCHOOL/WORK LINKAGE PROJECT,
*Des Moines, Iowa, October 28, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: Enclosed are my comments regarding your upcoming hearings on the National Apprenticeship Program. I appreciate the opportunity for input to the committee's decision.

If I can be of service to you and/or the committee, please call on me.

Very truly yours,

DAVID L. BILLINGS,
*Coordinator, School/Work Linkage Program.*

Enclosure.

## THE APPRENTICESHIP SYSTEM, 1983 AND BEYOND—A POSITION PAPER

(By David L. Billings, Des Moines Public Schools, Des Moines, Iowa)

The National Apprenticeship Act was approved on August 16, 1937. The purpose of the Act was to "promote the furtherance of Labor Standards . . . safeguard the welfare of apprentices . . . encourage contracts of apprenticeship . . . bring together employers and labor for the formulation of apprenticeships . . . and cooperate with state agencies in formulating standards of apprenticeship. This Act was a very simply one, four short paragraphs to be exact, but it set the pattern for future apprenticeship programs. The uniqueness of the Act is that it used words such as promote, encourage, together, cooperate, to spell out its objectives. Such words brought together employers and labor in a spirit of cooperation and mutual benefit and not by the force of law. The Bureau of Apprenticeship and Training was established to carry out the objectives of this Act.

Apprenticeship did not come into being with the National Apprenticeship Act but rather updated and established standards to fit the modern world. Early history records apprenticeship as a functional, effective method of training people to be skilled artisans. Apprenticeship provided a method of supplying this nation with skilled workers during its infancy. Such American patriots as Paul Revere and Benjamin Franklin were once apprentices. In early days, apprenticeship was a family tradition handed down from father to son over the generations. This tradition has carried down over the years to modern times.

These remarks deal with the history of apprenticeship and are an attempt to set the stage for addressing the future—"The Apprenticeship System—1983 And Beyond."

Apprenticeship can play as important a part in our nation's future as it did in the past. we will experience over the next few years a critical shortage of skilled workers that could equal or exceed the shortage that existed in the 1700's and 1800's. Apprenticeship can help to alleviate that shortage because apprenticeship:

Is a structured training program that can be designed to fit the needs of individual employers and apprentices.

Is flexible enough to be used in the most sophisticated occupation or the most simple, provided they meet the four basic apprenticeship requirements.

Is recognized by employers and labor alike as a competent training method.

Permits employers to train people in their methods, procedures, techniques, and policies.

Has fast reaction time for changing requirements.

Can train new workers or retrain experienced workers.

A recent example of the flexibility and adaptability of apprenticeship is reflected in an experimental program sponsored by the Employment Training Administration and the Bureau of Apprenticeship and Training and operates in the educational system. This program, called School/Work Linkage Program, places high school seniors in skilled occupations as part-time apprentices. Students attend school in the morning, receive on-the-job training in the afternoon, and become full-time apprentices upon graduation, continuing their training, with the same employer. This approach has been well received by employers, since it allows them to train their employees in their own company's methods, policies, and procedures.

Another factor that makes this type of approach favorable is the changing age of the country's work force. This will result in our work force needing to be trained at an earlier age. The School/Work Linkage Program is flexible and can adapt to high school or vocational/technical colleges. The School/Work Linkage Apprenticeship Program can work well with Adult Education and/or Area Community Colleges for related training purposes. It also supplies an effective linkage with vocational/technical education and continues the training of young people after graduation. The educational community can have an effective involvement in apprenticeship development and training.

It is said that 80% of the jobs in this nation are in small business establishments. The word small in this case means different things to different people. In the Des Moines School/Work Linkage Program, the small business is under 10 employees. The vast majority of the skilled occupations developed are service type occupations. With this type of atmosphere, the apprentice is exposed to a wide variety of experience in his/her particular skill. The majority of these business establishments are non-union, nevertheless, the Des Moines School/Work Linkage Program receives strong Union support.

Since the Bureau of Apprenticeship and Training was establisehd in 1937, it has done an effective job in most areas in promoting apprenticeship. In more recent years, its effectiveness and coverage has diminished primarily because of a reduction in funds and staff. Its national leadership has changed frequently, causing a frequent break in the continuity of direction. The Bureau of Apprenticeship and Training should be continued, re-inforced with front line staff, stream lined to place more authority and flexibility in the hands of the state directors, a national policy established and a strong continuous in-house training program for all levels of staff to maintain the high level of standards within the bureau that made apprenticeship itself so successful and effective.

To repeat, our nation is expected to experience a critical shortage of skilled workers by 1990. That, coupled with new and emerging occupations, will require trained people. There is, even now, a need to re-train workers who have lost their jobs because of changing technology and other reasons. Defense preparedness is another area of training that we, as a nation will require, skills that as yet are not available in adequate supply.

Can apprenticeship do it all? Certainly not. But it can be the catalyst to draw it all together. The leader that can bring together and guide in whatever new direction we need to go. Education, business, community, labor, state and federal government, all with one objective, a highly trained, educated, skilled, work force.

Vocational Industrial Clubs of America, Inc.,
*Leesburg, Va., October 27, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Bldg., Washington, D.C.*

Dear Mr. Royals: This is in response to your letter concerning my feelings related to the apprenticeship program. First of all, I feel apprenticeship is an important training opportunity for this country and should be strengthened in the future. I have been most concerned about budget cutbacks and the lack of cooperation of vocational education because of limited staff.

For a number of years, I have worked closely with the Bureau of Apprenticeship and Training to encourage closer cooperation between vocational students enrolled at the high school level and the indentured process. Many years ago when I worked for the North Carolina Department of Education, we developed a cooperative agreement that would allow students enrolled in cooperative education to receive in some cases hours of credit toward apprenticeship. I feel this is still a worthy objective and should be pursued.

Every effort should be made to involve the apprenticeship system in trade and industrial education since most related training is offered as part of trade and industrial education which, of course, is part of vocational education. I understand that there is a move on the part of the Department of Education to take apprenticeship and even further divide it and set it apart—this is not good. It should be interwoven into every aspect where feasible.

Efforts should be made to make available trade and industrial education shops nationwide on an evening and weekend basis to offer related training. Legislation, if necessary, should be proposed to allow this to happen. In too many states, our shops are not available if they are secondary. This limits the availability of training opportunities.

A final point is that over the years it seems as though education and apprenticeship have drifted apart. I would like to see efforts made to pull this together and have additional ideas as to how this might happen.

I appreciate the opportunity to comment and look forward to hearing from you.

Sincerely,

Larry W. Johnson, CAE,
*Chief Executive Officer.*

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State of Washington,
Department of Labor and Industries,
*Olympia, Wash., September 22, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: I am pleased to be informed that the House Committee on Education and Labor will be reviewing means for strengthening the National Apprenticeship Program. The Washington State Apprenticeship Program was recently reviewed and evaluated by both houses of our state legislature. The results of that evaluation underscore the fact that here, in Washington State, apprenticeship training is not only viewed as a vital and cost effective method of employment training but also a legitimate public policy concern at the state level. It should be no less of an interest to the federal government.

In your August 29, 1983 letter, you correctly identified that a successful national and state apprenticeship program must have strong linkages to business and industry, employee and employer association, and to the educational systems. Since the apprenticeship method of training is formulated to meet both the present and future skill needs of employers and employees, its strengthening would be a positive step toward ensuring that skilled workers are available to meet industry's future needs.

Frankly, the recent state of apprenticeship has been stagnant. There are several reasons for this. First, and foremost, there has been a lack of government involvement in economic development planning. Employment and training policies and programs are a critical component of economic development. Service programs, such as apprenticeship and training, which are directed at the on-going and future needs of the private sector are often placed on the fiscal and programmatic back-burner. Obviously, government must respond to immediate critical needs of citizens. The basic services and benefits which preserve a quality of life, such as medical, retirement and income maintenance programs, must continue to be funded. However, government policies and programs which address the future employment and training needs of business, industry and employees are only now receiving attention.

Secondly, the national and many state apprenticeship programs have found themselves reduced to playing a bureaucratic numbers game rather than providing service. In the politics of the budgetary process, numbers of programs and apprentices count for more than quality of service and involvement in employment and training in planning and ensuring sound economic development.

Lastly, apprenticeship and training has failed to include all the necessary constituencies to achieve program growth and adaptability to a changing national and international economic environment. All too often, the national and various state programs fail to establish program linkages to all affected constituent groups.

The Washington State Apprenticeship and Training Program has initiated a serious effort to participate in state economic and human resource planning. The Apprenticeship and Training Program has re-defined its business on an intergovernmental and interagency level. Since modern apprenticeship training inherently involves a partnership between industry, labor and government, the Washington State Apprenticeship Program has adopted a facilitating role to better coordinate the deliver of available technical assistance to program sponsors. To accomplish this objective, our apprenticeship program has established linkages between itself and relevant state and local economic development, employment training and eductional agencies at the policy-making and service delivery levels.

The Washington State Apprenticeship Program has adopted a long-range plan to expand apprenticeship to new industries and occupations. Our state program has given a high priority to reviewing and enhancing the quality of registered programs.

In order to achieve these goals, our state program found it necessary to reorganize its staffing patterns. New supervisory positions were created to ensure uniform, consistent and timely application of apprenticeship policy throughout the state. A new staff position was created and charged with maintaining close interagency, intergovernmental and constituent group relations in the development of new apprenticeship programs.

The membership of the Washington State Apprenticeship and Training Council also reflects our state's redirection of apprenticeship. The Washington State Apprenticeship Act has been amended to add a public member, appointed by the Governor and confirmed by the Senate, in addition to the existing employee and employer representatives.

At the present time, the majority of registered apprentices are indentured into programs in the construction industry. Any discussion concerning the future of apprenticeship must anticipate that this will be also be the case in the near and intermediate future. Apprenticeship programs in the building and construction trades have been and will continue to be vital to the health of the national economy. Construction industry programs are affected by technological change, as are other sectors of the economy. The successful application of new materials, tools and construction techniques depends upon the existence of a quality work force. The national and individual state apprenticeship programs should continue their awareness as to the service needs of these programs particularly in terms of quality applicants, related instruction requirements and new work processes.

There will be, however, new opportunities for apprenticeship training in newly emerging industries and occupations. In service industries, such as health care, and in the development of technologically advanced products, there is a potential for program growth. This will require that the national and individual state apprenticeship programs undertake a serious effort to understand the special training requirements of each potential program sponsor and deliver whatever array of services are available to meet those identified needs.

Of course, no review of apprenticeship would be complete without discussions of federal and state roles. A distinction should be made between overall national apprenticeship needs and the special role of the Bureau of Apprenticeship and Training (BAT) U.S. Department of Labor, in states without a state apprenticeship council.

In my opinion, the entire national apprenticeship system would benefit from nationally sponsored research in program development. This would include identifying emerging apprenticeable occupations, development of related instructional materials and teaching guides for apprenticeship instructors. Furthermore, the BAT could be of great service in disseminating case study information on successful program development efforts throughout the nation.

The BAT should consider redeployment of personnel to those states without State Approving Councils. It is imperative that these states receive the level technical assistance necessary to preserve and expand apprenticeship training opportunities. In states with State Approving Councils and adequate staffing, the federal government should maintain a level of effort necessary to disseminate national apprenticeship research, provide liaison services to state agency directors and monitor state efforts to assure compliance with affirmative action in apprenticeship. Activities pursued in addition to those just mentioned are largely duplicative of state-level resources and efforts.

Sincerely,

G. DAVID HUTCHINS,
*Assistant Director,*
*Apprenticeship Section, ESAC Division.*

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STATE OF MINNESOTA,
DEPARTMENT OF LABOR AND INDUSTRY,
*Saint Paul, September 12, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: Your August 18, 1983, letter containing the message, "The Committee has a strong interest in seeing the apprenticeship program strengthened. . . . ," certainly made my day. If the committee truly does have a strong interest and the power to strengthen apprenticeship, then I believe apprenticeship will survive and perhaps improve.

A great part of the problem with apprenticeship today is the total neglect it is suffering on the federal level. Anything that does come out of Washington, D.C. referring to apprenticeship is legislation destined to destroy it, for instance the 40% "helper" rule on Davis-Bacon jobs. Other legislation that will certainly have a detrimental effect on apprenticeship include so-called "jobs" bills that don't specify the dollar effective apprenticeship concept that could give the taxpayer something in return through training of highly paid skilled workers helping to shoulder the tax burden as opposed to temporary low paying make-work jobs.

Another threat to apprenticeship is the constant pressure from the "profit at any cost" faction, to allow a higher ratio of apprentices to journeymen. I've had requests for an outrageous three apprentices to one journeyman ratio and Colorado apprenticeship law now permits a one to one ratio. How can this possibly help the chronic unemployment problem in the construction industry? Of course, the problems of safety and quality training are obvious with these ridiculous ratios.

Some of the job categories recognized by the Bureau of Apprenticeship and Training as apprenticeable are very dubious and many amount to outright fragmenting of an existing trade. The Minnesota philosophy is first you learn the entire trade and then you may specialize in a particular area. I think B.A.T. should exist in every State with a mission of public relations and information and each State should provide a State Apprenticeship Council operation backed by an enforceable, solid apprenticeship law.

I believe funds should be provided to the State Apprenticeship Councils to allow the hiring of liaison people to promote apprenticeship to junior and senior high schools, women and minority organizations and business people interested in the apprenticeship concept. I think the majority of the potential workers and employers are totally unaware of the apprenticeship system and its "earn while you learn" concept. We need to make apprenticeship a commonly recognized method of training as they have recognized it for years in Europe.

To summarize the apprenticeship situation in my opinion:

Activate the Federal Committee on Apprenticeship;

Strengthen B.A.T. and restrict their role to promotion, consulation, and education of the public;

Monitor and change legislation that could harm the apprenticeship system;

Encourage all states to create a Division of Apprenticeship and State Apprenticeship Council;

Jobs bill legislation should be more specific in its reference to use of the apprenticeship system.

The key to success for apprenticeship now and in the future lies in the defeat of injurious legislation and promotion of the apprenticeship concept to the public.

I hope these few comments will be of value to you during your hearings on apprenticeship.

Very truly yours,

ROBERT L. WICKLAND,
*Director of Apprenticeship.*

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HONEYWELL, *October 13, 1983.*

THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Bldg., Washington, D.C.*

DEAR MR. ROYALS: Enjoyed our phone conversation that we had pertaining to training in industry. In line with that, I thought that I might recap some of that discussion so that you could get a better understanding of Honeywell's apprentice and other training programs.

Some basic facts. In the skill trades area of toolmaker and tool design, we have an 8,000 hour apprentice program. This can run anywhere from two to four years depending on the student's past experience. This particular program is state indentured in Minnesota. The number of students that we have over the years varies from relatively large classes of 30 to 50 and at times we are down in the 5 to 10 range. This is solely dependent on our needs which are closely tied in with an aging toolroom workforce and any growth that we might experience. At Honeywell, our long range plans call for fewer numbers of toolmakers, however the call for this skill in my opinion, will never disappear. The gradual shift from metal cutting to electronic componentry has caused this shift in need. Therefore, as a conclusion, I feel very strongly that an apprentice program is absolutely necessary to insure the proper training of a well rounded toolmaker.

In other trades, such as master electricians, machine repair, and so forth; we also have apprentice training programs. They too are state indentured. The numbers of students are relatively small but I might add very, very necessary.

On the telephone I mentioned to you that electrical technicians and their training are playing a larger role in our future, however the various trade schools and electronic schools with some on the job training has been fulfilling our needs.

In a recent undertaking of trying to improve our quality at Honeywell, we had a massive brainstorming exercise with most of our people participating. One of the major concerns in being able to compete with improved quality was the concern that the employees has for their on job knowledge. The plea was for training and more retraining. It wasn't in the expansion of training, but in regard to their present job that they spoke out. Collectively, at Honeywell we're addressing this question realizing that although we have massive training programs, our direction will have to change to meet the needs as the people see them. We are convinced this is going to cost us more money in training in insuing years. In conclusion, training of all types and especially apprentice training has to remain as an integral part on the U.S. manufacturing scene.

If there is anything else that I can help you with, please let me know.

Respectfully,

ROBERT M. JOHNSON,
*Manager, Technology Planning and Productivity.*

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PLUMBERS LOCAL UNION NO. 307,
*Hammond, Ind., November 2, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR SIR: We have been working with the Bureau of Apprenticeship and Training, U.S. Department of Labor, for many years. We have found them most helpful in handling problems relating to our program and industry. This assistance can be offered and relates to our needs because they are located here and are familiar with our area industry and people.

During the past years this service and interest has steadily declined as the Bureau staff has been restricted in their travels and continue to lose people. In training, the personnel contact is of utmost importance because we are dealing with people, not things.

We fail to see the reasoning in discontinuing the National Apprenticeship Activity when there are so many problems dealing with unemployment, under-employment and youth. Education doesn't make jobs—employers make jobs and this is the area where the Bureau can assist. If properly staffed and funded the Bureau can provide the most cost effective means in confronting many of the employment problems.

We would appreciate your support in improving community opportunities by proper utilization of the Bureau of Apprenticeship and Training, U.S. Department of Labor.

Thank you for your cooperation.

Sincerely,

**Robert J. Kramer,**
*Business Manager.*

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**Indiana State Pipe Trades Association,**
*November 2, 1983.*

Mr. **Thomas F. Royals,**
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

**Dear Sir:** We have been working with the Bureau of Apprenticeship and Training, U.S. Department of Labor for many years. We have found them most helpful in handling problems relating to our program and industry. This assistance can be offered and relates to our needs because they are located here and are familiar with our area industry and people.

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We would appreciate your support in improving community opportunities by proper utilization of the Bureau of Apprenticeship and Training, U.S. Department of Labor.

Thank you for your cooperation.

Sincerely,

**Robert J. Kramer,** *President.*

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**IUE Skilled Trades Council,**
*Evansville, Ind., October 26, 1983.*

Mr. **Thomas F. Royals,**
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

**Dear Mr. Royals:** Concerning the oversight hearings on the National Apprenticeship Act by the Subcommittee on Employment Opportunities, I wish to reply on behalf of the International Union of Electronics, Electrical, Technical, Salaried and Machine Workers (IUE), and the Skilled Trades Employees.

Presently the IUE maintains a national policy that promotes apprenticeship training through collective bargaining processes. We believe apprenticeship training is necessary for a number of reasons.

(A) Without a proper trained work force the industries we represent would be less competitive.

(B) It would be difficult to rebuild our work forces to a high rate of employment without a skilled work force.

(C) The concept of apprenticeship training has not been matched with other known methods of training, we as an independent nation cannot ignore the loss of development of our own human resources.

The apprenticeship programs are disappearing at a rapid pace due mainly to the economy. We as a representative Union cannot justify at this time the training of apprentices in the areas where we have thousands of workers on layoff and hundreds of trained Journeymen shifting to other jobs.

If we are to return and maintain a full employment economy we need skilled, trained people. Training began to decline when funds that maintained the apprenticeship system were sharply curtailed. Shortly after the Reagan Administration took office the Federal Committee on Apprenticeship, the Federal Apprenticeship Statistical Reporting System, Information Centers and the loss of many Federal Employees that promoted the apprenticeship system were no longer effective.

The Federal Government needs to reactivate these areas, with proper funding, to keep the apprenticeship program going and to keep the American people working.

The concept of apprenticeship training should begin in the lower levels of our educational system. Instructors should become fully aware of the apprenticeship system and the needs and benefits of such programs. Apprenticeship training, especially, needs to become a major role in Vocational schools.

Many major industries have ignored the formal training concept by shifting their interest to profits. This attitude has hindered efforts by Government and unions to stimulate proper training. Therefore, a Mandatory Training Program should be considered and especially in all Government Contracts.

The United States needs to keep pace with the other World Trade Countries in training concepts. America needs to build and maintain a skilled work force and needs to do it now.

Sincerely,

ELMER L. RANSOM,
*Chairman, IUE Skilled Trades Council.*

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NATIONAL IRONWORKERS & EMPLOYERS TRAINING PROGRAM,
*Alexandria, Va., September 28, 1983.*

Hon. JOHN N. ERLENBORN,
*Ranking Republican Member, Committee on Education and Labor, House of Representatives, Rayburn House Office Bldg., Washington, D.C.*

DEAR CONGRESSMAN ERLENBORN: Thank you for the invitation to submit written comments on the present and future of apprenticeship.

I share your desire to see the nation's apprenticeship system strengthened. Despite the obvious benefits of apprenticeship to American Industry and its proven quality, it is unrecognized and fragmented in its administration.

I believe that the upcoming hearing will be fruitful and bring about many positive results.

Sincerely,

FREDERICK HERZOG,
*National Senior Instructor.*

In response to congressional concern about the structure and direction of apprenticeship in American industry, I should like to submit my comments and views concerning this topic. These comments are a practitioner's point of view based upon extensive experience with technical and skills training in business, labor and industry. They are based upon the problems that have been encountered in training people in both high and low technology industries. Thus, the views expressed here are based largely upon personal experience, discussions with representatives of labor and management, local, state and federal government and on personal observations in a variety of work settings. There may be some who will take issues with these comments. That is to be welcomed since the main objective of my comments is to stimulate thoughts about ways to address real problems that currently exist concerning apprenticeship and training. These comments are not steeped in statistics. Many of the views deal with issues for which no statistics are readily available. They are, however, based on wide experience and the prevailing opinions of the people in the world of work.

Many studies have been conducted that pertain in one way or another to apprenticeship and training. Few, however, have examined the broader topic of apprenticeship and trainings' relationship with and impact on society at large. The U.S. Department of Labor funds an enormous training establishment. Literally hundreds of individuals receive formal training each year, and there is probably an equally large, if not a larger amount of informal on-the-job training. Yet, for all the potential importance of apprenticeship and training, surprisingly little is known about, first the training of craftsmen, second, the impact on the economically disadvantaged or third, the present or potential interaction between craft training approaches and technologies. To be sure, there are scores of studies and articles pertaining to certain narrow aspects of apprenticeship programs. But, it seems impossible to uncover any studies that attempted to survey in a broad sense the topics presented.

There is probably no area of the American industry that has had less truly professional, scientific and organized attention than the critical factor of apprenticeship and training. The picture has been one of piecemeal solutions. Bromides and panaceas have been advocated by amateurs who consider themselves experts. Seldom has a total professional approach been taken to the management of apprenticeship and training.

The payoff to apprenticeship appears to vary in two important respects. First, apprenticeship training that is part of a trade has a greater impact on labor market outcomes than training in unrelated areas. Second, the payoff to apprenticeship training is higher because apprentices are employed in jobs where their training can be used.

Two major apprenticeship training trends have been observed; first, a decreased dependence on apprenticeship for training and second, an increased use of outsiders for design, development and implementation of training. These outsiders, for the most part, are consulting companies which produce custom-designed programs. The driving force for these trends seems to be a lack of response by apprenticeship programs in adapting their offerings to meet a local industry's needs. In addition, training personnel do not view their operations as profit centers or as units which should provide management with a return on investment. Management does not train apprentices willingly because apprenticeship is viewed as a cost and a cost for which the return on investment or cost benefit is not easily discernable to them.

There is a link between declining productivity and the lack of adequate skill training. Government, labor and management must work together to design apprentice programs that serve the needs of the work force as well as the demands of the work-load. This demonstrates that what is needed is good technical assistance by persons who have a depth of planning, programming and operating experience in every phase of manpower planning. Even with the best intentions and the best structure, until there is a major commitment on the part of the U.S. Government to provide adequate training and education to prepare people at the local level, it is unlikely there will be trained people to assure that apprenticeship programs have the impact they are intended to have.

Solutions are difficult because they will first require a change in government and labor/management philosophy. As long as management philosophy is to produce good financial reports on a year-by-year basis, it will be hard to install training programs which will not show their effectiveness for several years. Secondly, if apprenticeship programs wish to participate in training and industry in the future, stronger linkages will have to be built. School personnel will have to leave the classroom, to some extent, and follow their apprentices into the working environment. On the other hand, apprentice schools hardly have the resources to do this on their own. Government and industry will have to provide some of the human and financial resources to allow schools to provide them with this type of service. In such an arrangement, apprenticeship schools will have to be prepared to accept a much higher degree of accountability for the apprentices they produce.

What are the projections for future training in American industry? The answers to that question are somewhat subjective and depend upon the perspective from which one has viewed the past progress. There will be more and more need to provide apprenticeship training in industrial applications. This need will be driven by a greater and greater use of sophisticated equipment, a continued decline in the availability of a skilled work force and the more highly competitive nature of business. The need for more efficiency, more productivity and lower cost in production will require more and more apprenticeship and training. Unfortunately, I believe, American industry is not currently geared up to provide all the technical skills training that will be required.

The United States has an historical commitment to assist its citizens in entering the mainstream of our economy. Our nation was founded upon and attained a unique position of world leadership through a competitive, free enterprise system of human resource development and a spirit of individual freedom and opportunity. In the last several years, the neglect of promoting apprentice and training has brought about a decline in American productivity and an increase in stagflation. This situation has not only prohibited opportunities for young citizens to enter, but caused many to fall from the mainstream of the work force.

Recent policies of the federal government to create jobs, train workers and ensure income or subsistence for the unemployed has had sound intent and objectives. However, they have lacked consistent and clear goals, been over and mismanaged, cost too much for the achieved results, generated increasing disincentives to work and failed to gain public support. To restore positive direction to sound apprenticeship and training, government, labor and management could create a National Commission having as its objective to meet manpower needs with a practical, flexible approach that can deliver long-term increases in employment and productivity through a more effective structure, with more efficient financing and less restriction.

In attempting to analyze the future and invent relevant futures are fraught with risk and uncertainty. But a deliberate, conceptual consideration of known and predictable events provides the best procedure available for deciding what the future will be. If a National Commission takes into account trends, operating environment, and what American industry needs in the future, manpower planning can be amazingly accurate and will bring about success.

The time has come for the U.S. Congress to recognize that prolonged planning does not necessarily produce the kind of local innovation and initiative expected. Little effort has been made to improve or redesign apprenticeship programs already in existence to meet the needs of the American industry. The Bureau of Apprenticeship and Training has not used its clout to bring about needed changes in existing programs, but rather have rationalized their performance in the creed that constant improvements would be made by private industry. This dusty creed does not meet with reality.

Renis Likert, in his work at the University of Michigan focusing on the dollar value of people, ascertained that the total company expense of human time and presence on the job amounts to seventy percent of the total cost of operation. In this same vein, Dr. Eli Ginzberg, former chairman of the National Manpower Advisory Committee and one of the nation's leading human resource authorities stated: "Of all the resources that go into our economy and come out in income, something of the order of three-quarters are personnel-related costs. What more proof do you need that you ought to manage that resource better?"

If we, as a nation are serious about revitalizing this country's manpower base to meet the economic challenges of the 1980's and beyond, we must pursue human resources development which insures that the work force has the skills to complement the future demand for skilled personnel. Without vigorous, farsighted and continuing training efforts, we are in a position of eating our seed corn: We may fend off starvation for one more winter, but we have removed the last hope of surviving the following winter. How successfully and how quickly the federal government deals with today's manpower problems will affect its vitality for decades to come.

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STATE OF MARYLAND,
DEPARTMENT OF HUMAN RESOURCES,
*Baltimore, Md., September 23, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee On Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: This will respond to your letter of August 29, 1983 in which you requested written comments on the state's current operation and the future of the apprenticeship program. As Secretary of the newly created Maryland Department of Employment and Training, which will assume responsibility for administering the Maryland Apprenticeship and training Council on October 1, I am pleased to respond to your inquiry.

Currently, the Maryland Apprenticeship and Training Council (MATC) consists of seven (7) members: three (3) represent employees and/or employees' organizations, three (3) represent the business and industrial community, and one (1) is a public member. The members of the MATC are appointed by the Governor with the advice of the Secretary of Employment and Training and with the advice and consent of the State Senate. At present, one business/industry representative's position is vacant but should be filled within the next 30 days. The MATC also has on staff five (5) field representatives whose function is to encourage business and industrial employers to register apprenticeship programs with the MATC.

The United States Department of Labor's State Bureau of Apprenticeship and Training (BAT) and the MATC have a very harmonious working relationship. The State BAT Director and two staff field representatives work closely and cooperatively with the Council. However, one State BAT field representative's position has remained unfilled for six (6) months. Filling this position is the responsibility of the Regional Director of the USDOL-BAT. We believe that a fully staffed State BAT is essential to the future of a viable apprenticeship program. Strong, efficient and cost-effective apprenticeship programs are badly needed and sufficient personnel are needed at both the federal and state levels to assist sponsors in developing these programs. In particular, the Bureaus of Apprenticeship and Training should be stronger than the individual state councils because the bureaus must be in a position to support businesses and industries which are diversified and which operate under more than one state's jurisdiction.

Currently, Maryland has 574 registered apprenticeship programs with a total of 4,366 enrolled apprentices. The number of enrollees in an individual program ranges from one (1) to 1,115. Generally, the number of enrolled apprentices has been steadily declining while the number of sponsors remains fairly stable. However, the rate of sponsor turnover is high. There are three factors which contribute to this situation: 1) the poor economy, 2) insufficient BAT and MATC field staff to service current and potential program sponsors, and 3) the inability to access additional funds as the fiscal year progresses to fund new/additional programs. In summary, since 1971, the rate of program completions increased by about 21%, while new enrollment declined by about 22%.

The MATC maintains a viable linkage with the Maryland State Department of Education. In its FY 1984 budget, the department distributed $581,194 to state and local educational agencies for the purpose of providing apprenticeship-related instruction to individuals enrolled in MATC apprenticeships. The department also has an ongoing pre-apprenticeship program which links schools and employers in an effort to involve students in work-study experiences which can lead to actual apprenticeship enrollment once students leave school. This program is being operated on a pilot basis in several subdivisions within the state and is showing very favorable results.

The future of the apprenticeship program will ultimately depend on the degree of commitment and cooperation among all concerned entities: government at all levels, business, industry, unions, the educational community, and the sponsors of other training programs. In particular, it is imperative that federal funds which are allocated to the states under the Vocational Education Act, as amended, be made available to fund apprenticeship programs. Under the Act, funds from which monies for apprenticeship training can be drawn are made available to the states' Supervisors of Vocational Education to be disbursed at their discretion. To date, no federal funds have been allocated to apprenticeship training in Maryland from this source. This is a situation which urgently needs to be remedied.

This Department is strongly commited to the future of the apprenticeship program in Maryland and we would welcome the opportunity to send a representative to testify at the committee's hearings or to meet with you or any committee member at a time which you may select.

Sincerely,

BRENT M. JOHNSON,
*Secretary, Department of Employment and Training.*

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THE COMMONWEALTH OF MASSACHUSETTS,
DEPARTMENT OF LABOR AND INDUSTRIES,
DIVISION OF APPRENTICE TRAINING,
*Boston, September 22, 1983.*

Mr. THOMAS F. ROYALS,
*Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: Apprenticeship Agencies have been established in 29 States, District of Columbia, Virgin Islands and Puerto Rico.

The Commonwealth of Massachusetts fully funds all aspects of the Apprenticeship program including those related instruction classes administered under the Division of Occupational Education.

The only federal funding received is through a contract for services with the Veterans Administration. As the recognized State Approval Agency for Apprenticeship, Massachusetts received $72,759.00 during fiscal 1983.

The Massachusetts Division of Apprentice Training is a Division within the Department of Labor under the Secretariat of Labor and is currently directing its efforts toward the introduction of apprenticeship into new industries and occupations.

We are pleased to have the opportunity to submit this information on the Massachusetts Apprenticeship Program for the consideration of the Committee on Education and Labor.

Sincerely,

JOHN J. MCDONOUGH, *Director.*

The Commonwealth of Massachusetts,
Department of Education, Division of Occupational Education,
*Quincy, Mass., August 25, 1983.*

Mr. Thomas F. Royals,
*Liaison Officer, Committee of Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

Dear Mr. Royals: Relative to your letter of August 8, 1983 pertaining to apprenticeship training, the following ideas are submitted for your interest and information.

Needless to relate the interest being generated by your office is a welcomed activity. For many years the low and dismal enrollment total of under 300,000 apprentices annually has been a negative factor in terms of productivity and quality items, and insufficient in meeting the needs of individuals and industry.

(1) The Federal government should set the example by having an active Advisory Committee, in order that State Advisory Committees can emulate and collaborate with one another.

(2) The Federal, State and local public agencies should set the example, by implementing apprentice programs, thereby setting the example for the private sector.

(3) The Fitzgerald Act should go beyond the enabling component and provide limited funds for training purposes with appropriate accountability.

(4) Provide a tax credit incentive to employers for all apprentices, not necessarily restricted to the disadvantaged.

(5) The role of the Bureau of Apprentice Training should be modified and avoid duplicating the recruiting and placement activities being done by the states.

(6) We should increase the pre-apprentice activities in secondary schools.

(7) Provisions should be made for the implementation of apprentice orientation sessions in the middle school grades.

(8) We should mandate the utilization of Federal funds in the vocational act for apprenticeship training and not necessarily an optional provision for the states to decide.

(9) Provisions for the expansion of apprenticeship in the new and emerging occupations in the high technology areas should be made, in order for them to join the apprenticeship family.

(10) With the Federal government paving the way, conduct a National Apprentice Conference with employers, education, labor and non labor organizations participating. However, emphasis should be placed on employers participation.

Sincerely,

Anthony V. Cipriano, Ph. D.,
*Director, Bureau of Post-Secondary Occupational-Technical Education.*

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American Society for Training & Development Inc.,
*Washington D.C., October 17, 1983.*

Mr. Thomas Royals,
*Minority Legislative Aide,*
*House Education and Labor Committee,*
*Washington, D.C.*

Dear Mr. Royals: Here are a couple more responses on the apprenticeship issue that I have not given you. I had misplaced them, unfortunately.

Best regards,

Robert L. Craig,
*Vice President,*
*Government and Public Affairs.*

Enclosures.

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Construction Advancement Program of Colorado,
*June 8, 1983.*

ASTD Government Affairs Office,
*Washington, D.C.*

Gentlemen: This is in response to the ASTD National Report, Vol. 9 No. 10 Issues Agenda: Thomas Royals.

I am Director of Training for the Associated General Contractors of Colorado. I was an ASTD Torch Award recipient in 1977. One of my functions is being a trustee of our Colorado Statewide Carpenters Joint Apprenticeship and Training Program. I also provide similar assistance to our non-union members. I am intimately familiar with the Federal Bureau of Apprenticeship and Training and State Apprenticeship councils.

My point for writing this is to request all possible help to have the Federal BAT revived and strengthened. BAT tends to be much more responsive to the changing times and needs of non-union employers. State Apprenticeship Councils (SACs) are more strongly influenced by unions. In states with SACs, the SAC controls apprenticeship in the state. The union influence causes the SACs to drag their feet against assisting non-union apprentice and training programs.

This area of apprenticeship is one where a very conservative industry believes the Federal Government should remain strong and in control.

Sincerely yours,

DUKE NIELSEN,
*Director of CAP.*

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TAMPA ELECTRIC,
*June 7, 1983.*

Mr. ROBERT CRAIG,
*Government Affairs Office, American Society for Training and Development, Washington, D.C.*

DEAR MR. CRAIG, I am writing in response to the article about the Federal role in apprenticeship training that appeared in the May 23rd issue of National Report. The prospect of government intervention in apprentice training is not one that I find appealing no matter how well intentioned this intervention may be. Intervention at the Federal level usually means a set of rules and regulations with little relevance to the real problem and even less flexibility.

The Federal Government concept of apprenticeship in the past has been a process held captive to a set number of hours, years, and subject matter. This concept is no longer relevant. One reason is that time is not a measure of competence. Even using courses of study laid down by D.O.L. and others, there is no assurance that employees will obtain competency in a given number of hours, or conversely, that all those hours and that study material is needed. The employer is in the best position to determine what the needs are. The employer should determine competence based on the standards and conditions in the particular work environment. We must move away from the idea that competence and time (i.e. four years) can be equated.

Another problem with Federal intervention is apprenticeship training in the D.O.L.'s view of a traditional apprenticeship level being equated with extra dollars. With the rapid change in technology, this idea must change. In the area of technical training, we will have to embrace the concept of lifetime learning. Competence will be maintained only by having ongoing, dynamic training programs. Federal guidelines and their time consuming compliance procedures will only inhibit this type of training and hamper industry in its attempts to cope with rapid change. We are on the verge of, if not into a technological revolution. Change is rapid and the new technologies are complex. We should be preparing to change, not attempting to build roadblocks to change.

There is one area, however, that is remaining somewhat constant. This is the fact that those people lacking in basic educational skills will fail in today's complex marketplace. If the Feds want to enhance training, let them put their efforts at the elementary and secondary levels, and supply industry and postsecondary vocational education with people able to take advantage of the training already being provided.

This is an area that is of great concern to me. I would appreciate any information that ASTD could supply on the subject. Also, I think the National Report does an excellent job of keeping the membership up-to-date on critical issues.

Sincerely,

JAMES H. MEADOWS,
*Supervisor Training and Video Services,*
*Personnel Training and Development.*

REPUBLIC STEEL CORP.,
PERSONNEL DEPARTMENT,
*Cleveland, Ohio, June 17, 1983*

Mr. ROBERT L. CRAIG,
*Vice President, Government and Public Affairs, American Society for Training and Development, Inc., Washington, D.C.*

DEAR MR. CRAIG: In response to your letter of June 15, 1983, regarding apprenticeship training and the possible need for legislation pertaining to the role of the federal government, BAT, etc., I submit the following.

My personal experience with the BAT, Department of Labor within the State of Ohio, has been favorable. They have defined their role as advisory and have been anxious to provide constructive advice and recommendations.

I do not have a feel for any legislation that may be needed. Things seem to be working pretty well under the present system. Perhaps others are aware of iniquities that require legislative remedies, but I am not.

What I do feel is needed is strong support by all levels of government for an effective vocational school system. Good solid vocational training will help graduates progress successfully through specific apprenticeship programs. Although many items are mass produced today, we still have a need for the skilled craftsmen; and I believe this need will continue.

There is, however, a certain amount of rigidity in apprenticeship programs that companies and craft unions should be revaluating. For example, most programs require a specific fixed time to complete the training such as three years or four years. Provisions are not made for the fast learner. In some of our programs, we have incorporated what we call "Representative Performance Assignments". If an apprentice can demonstrate proficiency on an "RPA" we waive the training and award him/her the training hours. This advances the apprentice through the program on an accelerated basis. In some programs we do not have formalized "RPA's", but we award credit based on an evaluation of previous experience and demonstrated on-the-job skills. For example, a former drill press operator might not know anything about a lathe or milling machine and would require full training on those pieces of equipment while only needing some abbreviated training on the drill press. Consequently, training hours for the drill press could be awarded and progression through the program accelerated. Although this might sound like just common sense, many practitioners of a trade take the point of view that if it took them three years or four years to become a craftsman then it should take that long for anyone else who is learning that craft. Tradition is hard to change.

I hope my comments will be of value to you.

Very truly yours,

MARTIN C. WING.

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CONSTRUCTION ADVANCEMENT PROGRAM OF COLORADO,
*June 8, 1983.*

ASTD GOVERNMENT AFFAIRS OFFICE,
*Washington, D.C.*

GENTLEMEN: This is in response to the ASTD National Report, Vol. 9, No. 10 Issues.

Agenda: Thomas Royals.

I am Director of Training for the Associated General Contractors of Colorado. I was an ASTD Torch Award recipient in 1977. One of my functions in being a trustee of our Colorado Statewide Carpenters Joint Apprenticeship and Training Program. I also provide similar assistance to our non-union members. I am intimately familiar with the Federal Bureau of Apprenticeship and Training and State Apprenticeship Councils.

My point for writing this is to request all possible help to have the Federal BAT revived and strengthened. BAT tends to be much more responsive to the changing times and needs of non-union employers. State Apprenticeship Councils (SACs) are more strongly influenced by unions. In States with SACs, the SAC controls apprenticeship in the state. The union influence causes the SACs to drag their feet against assisting non-union apprentice and training programs.

This area of apprenticeship is one where a very conservative industry believes the Federal Government should remain strong and in control.

Sincerely yours,

**DUKE NIELSEN,**
*Director of CAP.*

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CONSOLIDATED EDISION CO. OF NEW YORK, INC.,
*New York, N.Y., August 29, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR TOM: Reference is made to your memo of August 18. My comments are noted below, in response to your request.

(1) I was directly exposed to registered apprenticeship programs several years ago at Uniroyal and Continental Can with the Rubber and Steel Workers, respectively. The chief problem which I saw was the tendency at that time for the union representatives on the joint committees to be solely interested in helping apprentices to move up on the progression scale, regardless of what they had learned or how their hours had actually been spent. They evidenced little interest in the learning process, only in completing the program as quickly as possible so that the apprentices could receive the journeyman title and pay.

Therefore, to be effective the focus of apprentice programs must be changed from "time served" to "skills learned".

(2) Professor Alfred Drew (now deceased) at Purdue University did a monograph of a "new" apprenticeship effort at Ford Motor Company in the early 1970s. I believe it was under a federal grant, but I am not certain. This was an attempt to focus on content, rather than time; a copy may be available from the Personnel Research Department at Ford.

(3) At Con Edison we have avoided use of registered apprenticeship programs. We do not use the journeyman titles (most of our workers are representerd by the UMUA, rather than IBBW) and we did not wish to be bound by the constraints created by federal registration. We have had strong union support for all skills training efforts, and we work closely with the union in developing courses and performance tests by which union members qualify to attend up-grading programs. However, decisions on what goes into the programs and the length of each are made by management.

(4) To me, apprenticeships seem most beneficial in areas like the building trades where the employers are small and have limited formal training expertise, and the employees represented by a craft union. It might be appropriate for auto mechanics, but I have no knowledge of their union relationships.

I hope this helps. I will add any further thoughts as they come to me.

Sincerely,

JOHN S. JENNESS,
ASSISTANT TO VICE PRESIDENT,
*Employee Relations.*

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GRAPHIC COMMUNICATIONS INTERNATIONAL UNION,
*Washington, D.C., October 6, 1983.*

Hon. AUGUSTUS F. HAWKINS,
*Chairman, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR CHAIRMAN HAWKINS: In response to your request regarding the Subcommittee on Employment Opportunities' oversight hearings on the National Apprenticeship Act, please find enclosed comments on apprenticeship in the graphic arts industry and, more specifically, within the Graphic Communications International Union's programs.

The short notice given for responding has limited our consideration and thoughts as to the apprenticeship issue. Hopefully, our abbreviated response will suffice and meet the needs of your Subcommittee. If there is anything that requires further details, please feel free to contact either Vice President William Schroeder (872-7920) of our organization or myself (872-7947).

We appreciate the opportunity of participating in the Subcommittee's activities and look forward to its' findings.

Sincerely,

WALTER LYPKA,
*Education Director,*
*Technical and Occupational Health Training.*

## APPRENTICESHIP PROGRAM IN THE GRAPHIC ARTS INDUSTRY

### INDUSTRY STRUCTURE

The U.S. Printing and Publishing Industry—classified by the U.S. Commerce Department a standard Industrial Classification 27—is comprised of 17 separate subindustries, each with distinct products or services offered to local, national and even international markets. The overall industry consists of 50,000 establishments dispersed geographically throughout the United States. This amount does not include an additional 40,000 to 65,000 inplant printing operations located within large establishments involved in business other than printing. Total employment was nearly 1.3 million at the start of the 1980's. The employment mix during this period has undergone a consistent shift. Rapid technological advances have changed the character of work for production workers and increased the size of the administrative and sales workforce.

According to the U.S. Department of Commerce, "Productivity of that workforce has been substantial, spurred by a capital investment program whose level of expenditures currently exceeds $2 billion annually."

For the most part, printing and publishing is a high decentralized industry with 80 percent of establishments having 20 or fewer employees. At the opposite end of the range, only about five percent of printing establishments employ more than 250. The remainder of establishments employ between 30 and 250 workers.

The overall impressions indicate that the printing industry is overall healthy—this is in opposition to the health of the U.S. economy and some other pronouncements of the health for the printing industry. In 1982, the printing and publishing industry was the only one in the manufacturing segment to show real growth, even though it was a minute .2 percent.

### APPRENTICESHIP BACKGROUND FOR PRINTING INDUSTRY

Apprenticeships in the printing industry have traditional roots right back to Gutenberg. Although the character of printing has evolved from one printing process (letterpress) to a multi-number of printing processes (lithography, intaglio, flexography, etc.) the basics of apprenticeship still prevails. An individual entering the trade is taken under the wing of the apprenticeship standards, with rights and responsibilities. In return, the apprentice is provided with trade services and knowledge. That tradition continues on today with additional influences. Today, in our printing industry, the apprentice learns on-the-job but is required on his or her own time to acquire supplementary education that reinforces and improves his or her working skills. Today's apprenticeship procedures are as complex as the society we live in. First, the apprentice must be selected from a number of applicants. Usually selection is made by joint apprenticeship committees (JAC's) with an equal number of management and union representatives. The selection is usually made on aptitude testing, personal interviews and/or any other methods that may aid the JAC in making the proper selection. All JAC's use the National Apprenticeship Standards as a guide in conducting their respective programs. In the Standards, there are 21 apprenticeable occupations.

The Graphic Communications International Union reviews and updates the standard every five (5) years. Where there have not been established JAC's, the apprenticeships have been chaotic and abused. There have been cases where unregistered apprentices have been made without indentures (and legal protection), taught a simple or uncomplicated productive task at reduced wages, and after completing their apprenticeship were terminated because they were earning full wages. Then the company would hire a new apprentice so as to get back to a better profit margin.

Many of the entry-force workers have received education which they anticipate will give them full knowledge in the graphic arts industry. In some cases this is true but in many cases it is not. A Graphic Arts Technical Foundation survey of graphic arts instructors in public institutions revealed that the average time that the instructor has been out of the industry is eight (8) years and a majority of them have developed their own curriculum. If you consider that the technology changes literally year by year, the longer those instructors are out of the industry the less relative is their teaching. The only assurance that one will get a sound foundation of education in a trade is the apprenticeship system since it is part and parcel of that industry as it changes and grows. This is true with the Graphic Communications International Union. To provide as best a training program for that entry force as possible, the GCIU training centers were started in 1964 because it was evident that the public institutes could not keep up with the changes and provide the on-the-job skill requirements. Thanks to cooperative management and union groups, training centers were established across the U.S. and Canada until today there are 23 training centers. In other areas, training programs utilize public institutes and inplant facilities. Although these training centers where initially developed for apprentices, one-half of the student body of these facilities are journeypersons either upgrading or retraining their skills as demanded by technological change. Our annual student body fluctuates between 2,000 and 3,000 students a year, with one-half of them being apprentices. It is no longer applicable for one to serve an apprenticeship and expect that skill to subsist them through their working life. There has to be some mechanism of continuing education and training to meet the needs of the industry and of the individual to stay gainfully employed. We have endeavored to meet this demand with consistent evaluation of markets, social changes, technological advances, and any other element that will surely affect the apprenticeship procedure. What we have, in-turn, is a productive worker with dignity who is an asset to his or her country and society.

If you ever do a study on apprenticeships, you will probably find that the drop-out rate (at least in the graphic arts industry) is less than 5% and, usually, those who drop-out probably have gone on to college or university education. One of the successes of apprenticeship is the fact that it works to an individual's needs. On the job, it will be a one-on-one training situation. In the GCIU programs, outside the job, our classes are very small. We recommend a maximum of no more than eight (8) to a class. We strongly believe in hands-on training because of the high knowledge retention. The equipment is not cheap, and that is one of our problems with training today. New technology is very expensive and the graphic arts industry is in the throes, as Alvin Toffler put it, "of the third technological wave". The transition from a photo-mechanical industry to one of the latest of computers and micro-electronic technology occurs for productivity, profit, or service—but it also has other effects. It changes the character of work and introduces new problems and hazards. Without National Apprenticeship Standards the apprentice would be bait-meat. He or she would not be protected by conditions set in those standards. They set the common groundrules agreeable to the employer and employee. The standards provide channels to deal with disagreements and potential conflicts between management and workers. The apprenticeship standards have been used to eliminate discrimination and to assist minorities into the higher paid jobs.

Anyone who would advocate the elimination of apprenticeship is also advocating the elimination of basic worker rights provided under those standards.

What is needed most for apprenticeship training programs is the acquisition of training equipment that represents the latest technology. There must be a way for apprentices to be able to get hands-on training that will prepare them for changing skill demands. Our philosophy has been to prepare for technological change and not be reacting to it. To accomplish this we are primarily interested in having access to the latest pieces of graphic arts equipment. What needs to be found is some incentive for equipment manufacturers to loan this equipment. We know in what direction the printing industry is evolving—what we lack is the equipment with which to prepare for those skill changes.

If the committee can provide some avenues to implement incentives for these manufacturers or suppliers, it would resolve the #1 problem in our apprenticeship training programs.

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NEW YORK CITY PUBLIC SCHOOLS,
*Brooklyn, N.Y., October 4, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: Your recent request addresed to the New York City Board of Education for a comment on the status of our apprenticeship program has been referred to me. This institution has a long unbroken history of providing services to apprentices and welcomes Congressional interest in supporting and strengthening these programs.

As the DLEA responsible for apprenticeship training in this region, the Board of Education is presently serving between 3,500 and 4,000 apprentices in a variety of skill areas. This related instruction is delivered in various modes and may be offered in the evening in a local high school, on-site in a union facility or as part of a "core" curriculum home study program. The latter requires the apprentice to complete specific assignments at home and meet with an instructor and/or special consultant once or twice a month for review and further assignments. In addition, telephone consultation is available to participating apprentices.

Our existing program represents an effective partnership of labor, business and education and is very successful in upgrading members of our workforce, enabling them to adapt to changing technologies.

The number of apprentices that we serve is directly related to the need for these individuals in the workforce. In the past several years, the demand for services has far exceeded our fiscal capability. We would welcome opportunities to discuss with members of your committee both innovative approaches to instruction in the future and most, importantly, new sources of funding for this vital program.

Sincerely,

ANTHONY J. BALDINO,
*Assistant to Chancellor,*
*Career and Occupational Education.*

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GUAM COMMUNITY COLLEGE,
STUDENT SERVICES DIVISION—PLACEMENT CENTER,
*Guam, Mariana Islands, September 9, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: The information provided is in response to your letter of August 18, 1983 concerning the status of the apprenticeship program, its operations today and the future of apprenticeship for the Territory.

The Apprenticeship and Training Program on Guam was first established in August, 1964 by Public Law 14-147 and was administrated by the Guam Department of Labor. An Apprenticeship Development Committee was established to study and address problems in the field of apprenticeship, to develop apprenticeship standards with the view towards developing local skills in the various crafts and trades for approval and registration with the Bureau of Apprenticeship and Training, U.S. Department of Labor.

On August 16, 1964, the Bureau of Apprenticeship and Training, U.S. Department of Labor, accepted and registered the first apprenticeship standards for the Territory of Guam under the sponsorship of the Guam Contractors Association (GCA).

Since the inception of the program, numerous problems have been encountered, some of which were: employers were not receptive or sincere in their commitment to train apprentices, coordination between Department of Labor and education institutions were minimal hence apprentices lacked the theoretical training exposure. Additionally, entry wages for apprentices were too low and unattractive. In essence, the program was recruiting applicants who were unprepared for the world of work and those who were able to adjust remained with the employers temporarily until better paying employment can be acquired.

To assist the apprenticeship program, the Administrative Policy for Alien Employment Certification was revised on April 5, 1974. The intent of the policy was "to assure maximum job and training opportunities to U.S. resident workers on Guam who are available for employment and training. Each employer will continue to hire and train U.S. resident workers and to replace non-immigrant alien temporary and parolees in all categories for which apprentices and trainees are available."

This policy provided a leverage the program needed in opening numerous training slots for apprentices.

On or about September, 1977, the certification processing of H-2 workers was reverted to U.S. Department of Labor and the Adverse Effect Wage Rate (AEWR) was implemented. This action superseded the 1974 administrative policy for alien certification and the wages in construction industries were increased. The intent of the AEWR was to attract local workers into the construction industry and to discourage employers from recruiting and importing H-2 workers.

The GCA apprenticeship standard manuals were revised in April, 1978. Major revisions were focused on the apprentices' wage schedules to conform with the AEWR. Entry wages were based on eighty percent (80%) of Journeyman wage rates. However, the rescission of the administrative policy for alien employment certification by the AEWR caused a tremendous reduction in employment opportunities for apprentices and employers' request for H-2 certification were processed without the aasurance of hiring and training local workers. Although the AEWR attracted better qualified applicants, the employers were reluctant to pay the higher entry wage rate for apprentices.

On July, 1978, the 14th Guam Legislature repealed Public Law 14-147 and enacted Public Law 14-77, the Guam Community College (GCC) Act of Guam which transferred the administration of the apprenticeship training program from the Guam Department of Labor GCC. The enabling legislation (PL 14-77) provided policy direction with realistic goals and objectives to meet local manpower requirements. Faced with the non-existence of apprenticeship curricula, the Apprenticeship Training Division (ATD) was tasked with the responsibility of its development and a curriculum specialist was recruited to provide the technical support. Related theoretical instructions for apprentices were implemented in the Fall of 1979. Presently, the ATD Staff, in cooperation with the Occupational Education Services Division of GCC, is continuously developing and improving its apprenticeship curricula with the concept of mainstreaming the apprentices to the degree program in their respective occupation (should they choose to do so).

The program, however, still lacked the total commitment of the private industries to train apprentices. Since the Guam Apprenticeship Program (registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training) does not have enforcement power, the College relies solely on the voluntary participation of employers and the cooperation of other Government agencies to assist in slot development for apprentices in public contracts. To assist GCC in its endeavor, a memorandum of understanding was developed between Guam Department of Labor and GCC for the purpose of soliciting training slots from employers through labor certification process (20 CFR, Part 655). Although apprentice recruitment increased, it was difficult to retain program participants with respective employers. It appears that employers' commitments to "train apprentices," were made only to satisfy the alien importation certification process.

The Guam Community College will continue with lobbying efforts for local legislation for apprenticeship on Guam.

The introduction of Bill 310, "An Act to Establish Apprenticeship Training System for the Territory of Guam and for other Purposes" on June 8, 1983 by the 17th Guam Legislature, will mandate the utilization of apprentices by private contractors on all public contracts for the Territory of Guam. The passage of Bill 310 will greatly enhance the apprenticeship program on Guam and provide the much needed training slots for the two hundred and sixty-seven (267) apprenticeship applicants with GCC.

Sincerely,

E. A. GUERRERO,
*Director for Apprenticeship Training.*

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AMOCO OIL CO.,
*Whiting, Ind., November 16, 1983.*

Mr. THOMAS F. ROYALS,
*Liaison Officer, Committee on Education and Labor, House of Representatives, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ROYALS: It has come to my attention that there is a movement afoot to slowly but surely eliminate the Bureau of Apprenticeship and Training, U.S. Department of Labor.

We at Amoco Oil Company have been affiliated with this organization since April of 1973 when three of our trade classifications, Pipefitters (Metals Mechanics), Instrument-Electricians, and Machinists, were registered with the United States Department of Labor, Bureau of Apprenticeship and Training, and again in December of 1979, we registered two more trade classifications; namely, Maintenance Repairer (Builder), and Operating Engineer (Equipment Handler). At present, 5 of our 6 trade classifications in the Maintenance Division are registered with the Bureau of Apprenticeship and Training.

Currently, in the six departments, we have approximately 750 employees. Fifty of these are still apprentices registered with the DOL-BAT. We have had approximately 300 of our work force in the Maintenance Division complete their apprenticeship under the DOL-BAT program. We are pleased with the results and would appreciate the continuance of this vital program.

Quality craftsmen are not made in the classroom. To make qualified craftsmen, it takes a marriage of related classroom training and on the job training. This, we are accomplishing with our present system of DOL-BAT. I would hate to see its demise. I would encourage you to give serious consideration to permit this Bureau (DOL-BAT) to continue to help us make the qualified craftsmen we need today and in the future.

Thank you.

Sincerely,

JOSEPH C. KOVACH,
*Maintenance Training Specialist.*

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THE MERIT SHOP TRAINING CENTER,
*Dublin, Calif., November 4, 1983.*

Hon. JOHN N. ERLENBORN,
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ERLENBORN: In view of the Subcommittee on employment opportunities chaired by Congressman Augustus F. Hawkins, as Director of Education of the Merit Shop Training Center sponsored by The Associated Builders & Contractors—Golden Gate Chapter, I would like to support and request your interest in giving more support to the Bureau of Apprenticeship and Training.

We have just begun a Apprenticeship program approved by the Department of Labor, and we feel that the Bureau of Apprenticeship and Training is necessary to keep for quality of skills training consistant. Department of Labor portrays a diminishing role toward the National Apprenticeship system and has not capitalized on the advantages of strengthening the National Apprenticeship Program. Apprenticeship is an unsubsidized training program that supports the private employer in training skilled work for his work force. The planned action of the Employment and Training Administration to decentralize the National Apprenticeship Program to the states, will not provide the quality of skills training required. My program will not benefit from this action. The service reliability and commitment to Apprenticeship demonstrated by the Bureau of Apprenticeship and Training staff would be a decisive loss. Local States Apprenticeship operation without National Bureau of Apprenticeship and Training guidance and participation in sponsor programs will result in decreased efficiency, impacting apprenticeship at the local level.

I firmly believe that the present administration should give more support to its Bureau of Apprenticeship and Training. Again, I request your interest and support. We need the continued direction supplied by the Bureau of Apprenticeship Training.

Sincerely,

MADELINE REYNOLDS,
*Director of Education.*

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STATE OF MONTANA,
DEPARTMENT OF LABOR AND INDUSTRY,
COMMISSIONER'S OFFICE,
*Helena, Mont., November 7, 1983.*

Hon. JOHN N. ERLENBORN,
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR MR. ERLENBORN: It has been brought to my attention that the Committee on Education and Labor, U.S. House of Representatives has scheduled oversight hearings on the federal apprenticeship program and activities for November 9 and 10 in Washington, D.C.

I share your interest in seeing the apprenticeship program strengthened as a means of supplying skilled training to meet our economy's changing employment requirements. Your Committee hearings can well serve to set the stage for an overall reassessment of the current federal apprenticeship system.

As you know, apprenticeship is structured training on-the-job coupled with trade related theoretical instructions or studies; it occurs over a relatively long period of time and the terms and conditions of employment and training are stipulated in advance. The second key element is that apprenticeship has as its goal the acquisition of all around transferable skills useable in differing employment situations. Apprenticeship has many advantages, including flexibility to adjust to new processes and materials, systematic training, employment security, decent starting wages, higher lifetime earnings, and a sound foundation for individual advancement.

Various studies have concluded that apprenticeship is a cost beneficial process that merits support, even expansion. It is generally considered to be the best method of training American workers for the skilled trades. Apprenticeship training, though thousands of years old, can and does adapt to changing times and circumstances. But the system needs to be aware of the changes going on in our economy. Those of us concerned about apprenticeship need to be aware of the impact so that we can cause it to be responsive.

An expanding and improving national apprenticeship system is essential to the welfare of workers and the economic well being of the nation. I believe we need to continue to improve the system and to make it a much more integral part of our overall employment and training policy.

Additionally, there exists an urgent need to clarify our public apprenticeship policy. This involves the redefinition of federal and state roles so that duplication of effort is eliminated and programs become stronger and more balanced; federal support to state apprenticeship agencies; establishment of state apprenticeship agencies in each of the 50 states; federal support of apprenticeship in occupations with critical skill shortages; apprenticeship research; development of related training materials; increased development and distribution of national pattern standards; workshops and increased technical assistance to State Apprenticeship Agencies; revitalization of the Federal Committee on Apprenticeship; tax deductions or credits; apprenticeship information clearing house; increased emphasis and thrust for minorities and women being admitted to apprenticeship training programs; federal-state partnership in the administration of public policy on apprenticeship; and an examination of the relationship of apprenticeship to public vocational education.

The need for a well defined national apprenticeship mission becomes increasingly evident as the future demand for craftworkers continues to grow and the expansion by occupation becomes diverse and more pronounced. An example is the contruction industry. In 1980 the U.S. Department of Labor, Bureau of Labor Statistics in their Annual Construction Industry Report estimated that 900,000 new jobs would be created for construction workers by 1990. In addition, 1.5 million vacancies will occur by workers leaving the industry because of retirement or transfer to other industries creating a need for a total of 2.4 million new construction workers by 1990. The present apprenticeship and task training programs are graduating an average of only 50,000 persons per year. Such statistics are clear evidence of the startling underutilization of apprenticeship training programs in the United States.

In conclusion, I urge the Committee to take careful deliberation on this most important issue. I feel confident that the national apprenticeship training system can benefit and ultimately get back on the right course toward a fundamentally sound future.

Sincerely,

DAVID L. HUNTER,
*Commissioner.*

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JOINT APPRENTICESHIP & TRAINING COMMITTEE,
PLUMBING & PIPE FITTING INDUSTRY OF SAN MATEO COUNTY,
*Burlingame, Calif., November 8, 1983.*

Hon. JOHN N. ERLENBORN,
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

DEAR CONGRESSMAN: I understand that the Subcommittee on Employment Opportunities chaired by Congressman Augustus F. Hawkins will hold hearings November 15-16, 1983 concerning the national apprenticeship training system. As an employer and trainer of apprentices, I have participated for over ten years in a voluntary program of apprenticeship based upon direction and assistance provided by the Bureau of Apprenticeship and Training representatives. Our program works well, and I am fully satisfied we are meeting my training needs, which is the development of skilled productive craftsmen.

The Department of Labor portrays a diminishing role towards the national apprenticeship system and has not capitalized on the advantages of strengthening the National Apprenticeship Program. Apprenticeship is an unsubsidized training program that supports the private employer in training skilled workers for his workforce. The planned action of the Employment and Training Administration to decentralize the National Apprenticeship Program to the states will not provide the quality of skills training requires. My program will not benefit from this action. The service, reliability, and commitment to apprenticeship demonstrated by the Bureau of Apprenticeship and Training staff would be a decisive loss. Local state apprenticeship operations without national Bureau of Apprenticeship and Training guidance and participation in sponsor programs will result in foot dragging and artificial barriers impacting apprenticeship at the local level.

I believe the present administration should give more support to its Bureau of Apprenticeship and Training because of its mission in quality training in the workforce. I request your interest and support at this time. A strong directed National Apprenticeship Program is in the interest of the economy and private employers like myself.

Very truly yours,

**Gerald F. Griggs**, *Coordinator.*

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Phoenix Building & Construction Trades Council,
American Federation of Labor and
Congress of Industrial Organizations,
*Phoenix, Ariz., November 10, 1983.*

Hon. John N. Erlenborn,
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

Dear Congressman Erlenborn: On November 16, 1983, the Subcommittee on Employment Opportunities will hold hearings concerning the National Apprenticeship Training System.

Please be advised that, as an employer, a former apprentice and instructor of apprentices, I am fully satisfied that we are meeting the training needs which is the development of skilled and productive craftsmen.

I am against the decentralization of these programs to the states and this proposed action would be harmful to the Apprenticeship Programs. I also feel the present Administration should give more support to its Bureau of Apprenticeship and Training as its mission is quality training in the workforce.

I ask your interest and support at this time. The National Apprenticeship Program is in the interest of the economy for all—the employer, the employee and the general public as well.

Thank you for your consideration to this request.

Sincerely,

**Dudley Brown**,
*Business Manager.*

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McKesson Chemical Co.,
*Union City, Calif., November 8, 1983.*

Hon. John N. Erlenborn,
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

Dear Congressman: It is my understanding that the subcommittee chaired by Congressman Augustus F. Hawkins is scheduling hearings November 15-16, 1983 regarding apprenticeship training and the role of the Bureau of Apprenticeship and Training.

I am writing to strongly urge that federal support for the National Apprenticeship Program and the Bureau's apprenticeship function itself be continued.

Historically, the concept of apprenticeship programs is as strong as ever. There is no more efficient way to produce skilled craftsmen than to provide actual hands-on training at the direction of those who are competent in their fields.

The Bureau of Apprenticeship and Training provides a critical function in areas of promotion and development. The federal apprenticeship agency must maintain a uniform national policy of apprenticeship. The Bureau has the expertise and staff to continue this continuity of training.

I believe the present administration should give more support to its Bureau of Apprenticeship and Training and urge that you too express my concerns in this matter.

I would ask for your support in this matter.

Sincerely,

**Lana Tabaracci**, *Secretary.*

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The State of Wyoming,
Department of Labor and Statistics,
*Cheyenne, Wyo., November 8, 1983.*

Re apprenticeship program.

Hon. John N. Erlenborn,
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

Dear Sir: I am writing to you in support of the necessity of scheduled hearings on the National Apprenticeship Programs. There is a great need for an overall reassessment of the current predicament of the federal apprenticeship program. It is a necessary step to give new guidance for such a worthy program.

Sincerely,

**Michael J. Sullivan**,
*Acting Commissioner of Labor,
State of Wyoming.*

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Field Ironworkers Apprenticeship and Training Program,
*Santa Fe Springs, Calif., November 10, 1983.*

Hon. John N. Erlenborn,
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

Dear Congressman, I understand that the Subcommittee on Employment Opportunities chaired by Congressman Augustus F. Hawkins will hold hearings November 9-10, 1983 concerning the National Apprenticeship Training System. As an Apprenticeship Coordinator of the Field Ironworkers Apprenticeship and Training Program, California/Nevada, with the invaluable assistance provided by the Bureau of Apprenticeship Training, we have developed a successful training program that provides our employers with the skilled productive craftsman that are needed in the industry today.

My concern at this time is the diminishing role the Department of Labor is taking in the National Apprenticeship System, therefore weakening the skilled work force in our country. As we all know, a highly skilled productive work force will keep us competitive in the world market. I am concerned and greatly disappointed to think that our government would consider turning their backs on a system as old and venerable as civilization itself. The practice of indenturing apprentices by our ancestors and passing on the skills of artisans to the workers of the next generation is a custom so old and so persistent that it must have some inherent merit and should not be lightly dismissed.

Fortunately for us, we have always had representatives, such as yourself that will express the views and concerns of the people in this country.

I believe the present administration should give more support to its Bureau of Apprenticeship and Training because of its mission in quality training in the work force. I request your interest and support at this time. A strong directed National Apprenticeship Program is in the interest of the economy and private industry.

I feel that the very important decisions that will be made by this subcommittee will have a direct impact on the future of our country.

I would like to thank you for your concern for apprenticeship.

Sincerely,

**Richard D. Sowers**,
*Apprenticeship Coordinator, California/Nevada.*

State of Idaho,
State Board for Vocational Education,
*Boise, Idaho, November 9, 1983.*

Hon. John N. Erlenborn,
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

Dear Representative Erlenborn: It is my understanding that the Subcommittee on Employment Opportunities, chaired by Congressman Augustus F. Hawkins, will be holding hearings November 16-17, 1983 concerning the national apprenticeship system.

As the State Director for vocational-technical education in Idaho, I wish to express my concern about any efforts that would diminish the role of the national apprenticeship system. Here in Idaho, the vocational education system and the apprenticeship program work very closely together.

The Bureau of Apprenticeship Training (BAT) office performs a very useful and necessary function. Apprenticeship must remain a federal and state partnership. The BAT provides a critical function in the areas of promotion and development in both SAC states and states without an apprenticeship agency. The federal apprenticeship agency must maintain a uniform national policy of apprenticeship.

Apprenticeship has long been recognized as one of the most cost effective methods of training in all segments of our society. It is the purest form of vocational training available. The present administration should give more support to the Bureau of Apprenticeship and Training because of its role in helping prepare a well-trained, quality workforce. Further, apprenticeship is, for a large part, administered and financed by private industry. When implemented properly, apprenticeship meet training needs with minimal government support.

Your support of the Bureau of Apprenticeship and Training is requested at the upcoming oversite hearings concerning the National Apprenticeship Program that will be held by Congressman Augustus F. Hawkins, Chairman, Subcommittee on Employment Opportunities, to be held November 16-17, 1983. Your personal interest in this matter is appreciated.

Sincerely,

Larry G. Selland, Ph. D.,
*State Administrator.*

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Sonoma Country Trades Referral Service,
*Windsor, Calif., November 7, 1983.*

Hon. John N. Erlenborn,
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

Dear Congressman: I am writing to express my concern over the retrenchment of field apprenticeship program activities of the Bureau of Apprenticeship and Training. I understand the parent organization, the Employment and Training Administration, is in the process of decentralizing the Bureau of Apprenticeship and Training's apprenticeship program activities to the states. This is not the direction that should be followed. If the states are the only source for promotion and development of apprenticeship, then women's opportunities will diminish.

Over the past few years, the Bureau of Apprenticeship and Training has had a specific initiative to expand and provide more opportunities for women in apprenticeship. Their staff has become knowledgeable and more attuned to the problems and needs of women in attempting to enter and remain in apprenticeship. They are better trained to focus on and develop women's outreach programs and to evaluate their effectiveness in the recruitment and placement of women in apprenticeship. The Bureau of Apprenticeship Training has an ongoing information program and supportive audiovisual equipment directed to presentations on women in apprenticeship. It has been my experience that the Bureau of Apprenticeship and Training's field staff has the necessary capabilities and self-starting initiative, as demonstrated through the years, to continue to provide more opportunities for women in apprenticeship.

Your support of the Bureau of Apprenticeship and Training is requested at the upcoming oversite hearing concerning the National Apprenticeship Program that will be held by Congressman Augustus F. Hawkins, Chairman, Subcommittee on Employment Opportunities, to be held November 9-10, 1983.

Your personal interest in this matter is appreciated.

Sincerely,

**Judith R. Weatherly,**
*Outreach Counselor.*

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Hon. **John N. Erlenborn,**
*Ranking Minority Member, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

**Dear Congressman:** I write for your support of the National Apprenticeship Program. The apprenticeship system is providing me with the personal opportunity of learning to become a highly skilled worker while receiving progressive wages based on my abilities to produce for my employer.

My training program is gratifying to me, in fulfilling my ambition of achieving journeyman status as a skilled craftsman. The Bureau of Apprenticeship and Training Representatives' role in providing assistance and guidance in our training program has played an important role toward my successful progress in the program.

Your support of the Bureau of Apprenticeship and Training is requested at the upcoming oversite hearing covering the National Apprenticeship Program that will be held on November 15-16, 1983 by Congressman, Augustus F. Hawkins, Chairman, Subcommittee on Employment Opportunities. Cutting back on the services of the Bureau of Apprenticeship and Training is definitely not the way to go, especially when there are so many unemployed youths desiring quality training at this time.

Your personal interest in this matter is appreciated.

Sincerely,

Mr. Rick Silva, Mr. James C. Bollier, Mr. Randy T. Cocco, Mr. Daniel Valentine, Mr. Timothy Hitch, Mr. Richard R. Polish, Mr. Barry Maynard, Ms. Kelly McCormick, Mr. Henry L. Navarro, Mr. John M. Honeburg, Ms. Linda Loeffler.

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**National Training Fund,**
**Sheet Metal and Air Conditioning Industry,**
*Washington, D.C., November 10, 1983.*

Hon. **Augustus F. Hawkins,**
*Chairman, Subcommittee on Employment Opportunities, House Committee on Education and Labor, Rayburn House Office Building, Washington, D.C.*

**Dear Sir:** Thank you for your letter of September 20 in which you afforded the opportunity to respond to the Subcommittee on Employment Opportunities as part of oversight hearings being conducted on the National Apprenticeship Act. A statement which addresses our concerns on this important issue has been prepared for your consideration and information.

Your thoughtfulness is appreciated.

Sincerely,

**W. L. Fillippini,** *Administrator.*

Enclosures.

## STATEMENT OF W. L. FILLIPPINI, ADMINISTRATOR, NATIONAL TRAINING FUND, SHEET METAL AND AIR CONDITIONING INDUSTRY

Mr. Chairman and Members of the Subcommittee: The National Training Fund of the Sheet Metal and Air Conditioning Industry is pleased to have this opportunity to present our thoughts regarding the importance of employee training programs and specifically the National Apprenticeship Act.

It is our opinion that the National Training Fund (NTF) is a unique program which should be looked upon by your Subcommittee and the entire Congress as a model for all industries.

This candid opinion is based on unprecedented facts which have been developed and proven during the 12 years that this comprehensive, joint labor-management program has been in existence.

To provide you with a better idea of the scope of the National Training Fund and its programs, I have provided, along with my statement, a copy of the 1983 NTF Annual Report and a copy of Volume 7 of the NTF Training Tips, a publication which is distributed to approximately 900 training instructors nationwide.

On May 12, 1971, a joint trusteeship was signed between management—the Sheet Metal and Air Conditioning National Contractors' Association (SMACNA)—and labor—the Sheet Metal Workers' International Association (SMWIA)—for the purpose of creating a national depository of monetary contributions. The monies derived were and are intended solely for the training of apprentices, retraining of journeyman mechanics, industry vocational instructor training, research into new technologies, plus other related subjects.

Our program's uniqueness includes the fact that 100% of all contractors signatory to a collective bargaining agreement throughout the United States, plus certain provinces of the Dominion of Canada, contribute on an hourly basis to the NTF. The hourly contribution rate is presently 4 cents per hour of work for each sheet metal journeyman and apprentice. A rate of 5 cents per hour has been negotiated for 1984, and 6 cents per hour for 1985.

As we have approximately 10,000 apprentices presently in training and represent in excess of 100,000 journeyman workers, our annual income per one cent contribution amounts to approximately $1.2 million.

At the hourly contribution rate of 4¢ for 1983, this comes out to $4.8 million. For 1984 at the rate of 5¢ an hour, the amount will be $6 million and for 1985 at the rate of 6¢ an hour, the total will be $7.2 million. This is in addition to approximately $12 million contributed at the local level in support of our 200 Joint Apprenticeship and Training Committees (JATCs). These Committees function at some 250 school sites throughout the country.

To date, $32 million has been spent on national standardized curricula development, supplemental audiovisual teaching supports (utilizing the latest techniques of laser beam/disc playback units), an intensive instructor training program under contract for 11 years with Ohio State University, plus research (training potentials) involving professional institutions of national repute.

The program is extremely successful due to the strong and active support of both its parent organizations, SMWIA and SMACNA, plus the fact that our policy is to work with and through our JATCs as constituted on state, local, and provincial levels. One of our mottoes is to work through and with "the local school board" concept.

We have proven that our industry itself is the only knowledgeable and capable decision-maker relative to its present and ever-changing needs. In order to justify this concept, labor and management are supporting this national endeavor with monies from within the industry; are directly and indirectly relieving the local taxpayer of millions of dollars by supplementing public school expenditures; and most important, they are making a nationalistic contribution of no little consequence as it effects manpower development.

However, in spite of all of this private sector, independent effort, very little, if anything, could have been accomplished if it were not for the long proven system of apprenticeship established by the Department of Labor through the Bureau of Apprenticeship Standards.

To destroy or weaken that fundamental, proven arm of manpower needs in our country would be counterproductive. Our program would likewise be fragmentized and severely weakened if the responsibilities of this important agency were eliminated or weakened.

It is our opinion that apprenticeship training within the United States must be strengthened if the United States is to meet the future manpower needs brought about by changing technology and foreign competition. To be effective, apprenticeship training must have substance. Related training and the on-the-job training must complement each other. Some "apprenticeship" programs are little more than entry level titles with little or no training. Our industry's apprenticeship tenure is four years—a period of training time, negotiated and agreed to through the collective bargaining process. It, plus other standards, is constantly being re-evaluated by both management and labor, collectively.

We in the sheet metal industry have always believed that increases in productivity and employment are directly related to training. A sound apprenticeship program promotes job satisfaction, provides the employer with qualified manpower and insures the customer of a quality product.

We also believe that increased federal involvement in registering (and monitoring) apprenticeship training would help insure a training effort that is rigorous, job-related, progressive, and substantial. Anything less is a disservice to our country in general and the apprentice in particular.

The Honorable John N. Erlenborn, the ranking minority member of the full committee, recently stated in part that, "Government also has related objectives in apprenticeship which have been established by law over the years. Government—federal, state and local—encourages the expansion of apprenticeship because it is a time-tested, cost-efficient method of producing skilled workers."

We fully agree with that statement and respectfully oppose any effort to fragmentize or dismantle existing federal programs regarding apprenticeship training.

On behalf of the National Training Fund, I would welcome the opportunity to provide further information that you may deem helpful.

Enclosures.

NTF
SHEET METAL AND
AIR CONDITIONING INDUSTRY

# TRAINING TIPS

NATIONAL TRAINING FUND
SHEET METAL AND
AIR CONDITIONING INDUSTRY
[illegible] Street, N.W., Suite [illegible]
Washington, D.C. [illegible]
Area Code (202) [illegible]
[illegible]
W. E. [illegible]

Vol. 7 No. 1 November 1983

## THE CALL TO PROFESSIONAL GROWTH

The need for expert sheet metal instructors has never been greater than now. Rapid change and increased complexity requires the best that apprentice and journeyman training can offer. Instructors are at the forefront of this change. The training program is no better than the instructor. Unless instructors grow professionally, their training programs will lag.

Professional growth also has a personal appeal. It has to do with personal self-esteem and satisfaction. Instructors who grow professionally get a sense of self worth that otherwise would not occur.

The "if you are going to do it, do it well" notion therefore has a payoff, for instructors personally, and the industry generally.

Professional growth is deliberate, not accidental, and comes to those who go after it. Instructors can choose from a variety of methods, formal and informal, to achieve professional growth. Many are cost free, and require only small amounts of time. Professional growth is cumulative. There are activities which are better at one stage of an instructor's career than another. The trick is to match professional growth activities with instructor needs and interests at particular times, and to pursue them persistently.

This issue of Training Tips speaks to professional growth for sheet metal instructors. Tips are included that can help instructors shape and pursue efforts to grow professionally throughout their careers, for their own benefit, and for the industry as well.

## NTF PROGRAMS POINT THE WAY

The National Training Fund Board of Trustees has been committed to professional instructor training from its beginning. The basic, advanced, and advanced professional development programs operated by The Ohio State University help instructors to plan lessons and programs, and to teach more effectively. Some program offerings also address new industry trends and development, along with their application to apprentice and journeyman training. The NTF Apprentice Curriculum and other NTF-produced instructional materials are utilized as references during training. Other NTF sponsored training programs provide instructors with new technical skills in testing and balancing, welding, solar energy and energy management. These technical programs put sheet metal instructors at the forefront of new industry development, and enable apprentice and journeyman training to keep pace with these changes.

NTF's instructor training strategy is deliberate and clear cut. A central intent is to elevate instructors to new levels of performance. Training includes a carefully selected blend of theory and practice that has it's application in local training programs. Instructor training programs are intentionally of short duration and concentrated to achieve efficiency in the training investment. Their effect is maximized by extending opportunities for training to as many instructors as possible.

The variety and depth of NTF sponsored instructor training has a dual effect. One is the new performance levels of instructors that are a direct result of these programs. The other is the foundation which this training provides for instructors to continue growing professionally through their own initiative and effort.

## LEARN BY TEACHING

Instructors have many opportunities to grow professionally through their own efforts, with very little time and cost involved. One is the increased competence that can be gained from teaching experience. The old adage "learn by doing" applies as much to teaching as to anything else. However, learning from teaching does not happen automatically. Deliberate action by the instructor is necessary. A year of teaching may or may not add up to a year of professional growth. The difference is up to the instructor.

What makes the difference between learning or not learning from teaching? Several things are very important, including the examples which follow.

### The Instructor's Attitude Sets the Stage

A key element is whether the instructor wants to grow professionally. Willingness provides an interest and curiosity about teaching, and a belief that trying to improve will pay off in increased skill. Believing that teaching is important to the apprentices and journeymen, and to the industry is essential. Instructors who have confidence in their own ability to improve will also tend to grow more through teaching practice.

**Planning is Important**

Carefully prepared lesson plans are essential to learning through teaching. Practice in stating objectives that describe learner performance; identifying content that relates directly to those objectives; selecting a variety of methods that are appropriate to the kind of lesson being taught; providing for application of new ideas; and checking whether learning occurs; are all important in preparing to teach.

Following a carefully prepared plan will likely provide a more successful experience than teaching without a plan. Teaching will be a more deliberate process. Likewise the instructor will be more likely to include all of the intended activities if they are written down beforehand. This fuller teaching experience will much more likely lead to instructor professional growth than would a less formal approach.

## SELF CHECKING YOUR TEACHING

Instructors frequently see three versions of their lessons: the one they planned; the one they taught; and the one they wish they had taught. Everyone who teaches probably has had this experience. There is a tendency to reflect on our teaching, at least informally. In doing so, we are checking our teaching.

Self checks on teaching can be very helpful to instructor professional growth. Especially so when two things are done. The first is to have a good plan for what it is we plan to teach. The second is to collect evidence of how we taught. A comparison of these two: what was planned; and what actually happened, is the basis for self checks on teaching. Both can be done with very little special effort.

The previous article emphasized the importance of having a good lesson plan in order for teaching to provide a useful professional growth experience. In this article we point to the need for a good lesson plan as a basis for checking what the instructor intended to teach. A good lesson plan states the intentions of the instructor, and is an important benchmark for later comparisons with what actually happened.

The next part of self checking is to collect some evidence of what actually happened during teaching. There are several methods for doing this.

**Instructor Remembers What Happened**

This is probably the simplest way for the instructor to collect information about what happened in a class. It also can be the most inaccurate for two reasons. One, it depends entirely upon the instructor's memory; two, it reflects the instructor's bias and provides only what the instructor perceives. This problem can be offset somewhat by recalling what happened as soon after class as possible. The instructor reviews the lesson plan and attempts to recall whether all main points in the lesson were covered, and whether learners achieved what was intended. It is also a good time for the instructor to consider whether some part of the lesson would have been more effective if done some other way.

It is likely that the instructor will make some judgments about how the lesson was taught through the process of mental reflection. These judgments should be noted for future reference. A good way is to make notes on the lesson plan before filing it away, as reminders to consider when teaching this particular lesson another time.

**Record the Lesson on Audiotape**

Taping lessons is fairly simple for the instructor to do, and adds some advantages over instructor memory. A tape recording will provide the audio part of a lesson accurately and in detail. Although more instructor time is required to listen to a complete tape, more will be gained than from just thinking about the lesson. A tape will reveal such things as questioning techniques; how much time was spent on a particular part of a lesson; and how well the class participated. It's also a good way for the instructor to check sentence structure, voice and other mannerisms.

Because it requires more time than simply thinking about the lesson, audiotaping might be used less frequently, or with new kinds of lessons, or when the instructor is attempting a new method of teaching.

After listening to the tape, the instructor should make judgments about the lesson in terms of what went well, and what changes would be helpful. Notes should be put on the lesson plan for future reference.

The fact that audiotaping of a lesson is occurring should probably be shared with the class. This will help class members understand what is going on and why. These persons will generally respect instructors who are consciously trying to improve their teaching.

BEST COPY

### Videotape the Lesson

Here we add the visual dimension to self checking of teaching. Much can be gained by the instructor who sees the class session as it actually occurs. Personal mannerisms of the instructor, such as facial expressions, body movements, eye contact with class members can be observed. Class reactions and participation, such as interest, enthusiasm and learner participation in class can also be checked through videotape.

Videotaping depends upon equipment availability, and can be more disruptive to a class. However, as with audiotaping, it is advisable for the instructor to prepare class members for what is happening. Emphasizing that the major purpose is for instructor improvement will be understood by class members. They can also be helpful in setting up and running the equipment.

Videotaping is probably best used occasionally because of the special effort involved. As in the case of other methods, conclusions and judgments by the instructor about the lesson can be noted on the lesson plan for future reference.

## LET OTHER PERSONS IMPROVE YOUR TEACHING

Other persons can sometimes be helpful in the improvement of teaching, and by doing so contribute to increased instructor competence. Asking others to react to teaching with their comments and suggestions does require a certain amount of openness on the part of the instructor. Instructors who are able to look at assistance by others in a positive way will find that it is well worth the investment.

Two particular kinds of groups are especially useful. One group is the apprentices and journeymen who regularly attend classes and look at the instructor's work from a consumer viewpoint. The other group includes other professionals, such as instructors and coordinators. Each group has particular uses and requires certain procedures to make the assistance effective.

### Feedback from Apprentices and Journeymen

Apprentices and journeymen who are a regular part of the training program have an excellent opportunity to observe instructor behavior. They are able to react very well to such things as: whether the teaching was paced too slow or too fast; whether the content was too difficult or too easy; whether the instructor's instructions are clear or vague; whether the instructor is enthusiastic or not; and whether the instructor's personal mannerisms and speech add or detract from teaching.

Feedback from apprentices and journeymen can be obtained formally or informally. Informal feedback can come from conversations in the office or hallway outside of class; or as a quick question to the entire class at the end of a lesson; and in numerous other situations.

Formal feedback can be obtained through questionnaires through which apprentices and journeymen react to statements in some kind of checklist. An example of an instructor checklist is provided on the last page. Reactions should be kept confidential so that persons will feel free to express their true opinions.

The examples thus far are helpful to gain reactions to the instructor's teaching. These reactions may or may not show accurately whether learning has occurred. Measurement of learning is done by the instructor through written quizzes and examinations, and through direct observations of performance.

Feedback from apprentices and journeymen therefore can be formal and informal, and include measurement and judgments regarding reactions to teaching, and actual evidence that learning has occurred. Instructors who aspire to grow professionally from the feedback of apprentices and journeymen are advised to use all of these methods to gain a balanced picture from these consumers of teaching.

### Have Other Professionals Observe Your Teaching

Fellow instructors, coordinators and others can provide constructive suggestions for teaching by observing and commenting. Other journeymen instructors can provide insight about teaching methods as well as on the appropriateness of the technical content of particular lessons.

Preparation for observation will be useful by identifying the purpose of the observation. This will help the observer to watch out for particular kinds of things. Observations will be more structured if the person observing is provided with a copy of the lesson plan, and some kind of outline or checklist for recording reactions.

Observations of teaching should be followed by discussions between the instructor and the observer as soon as possible.

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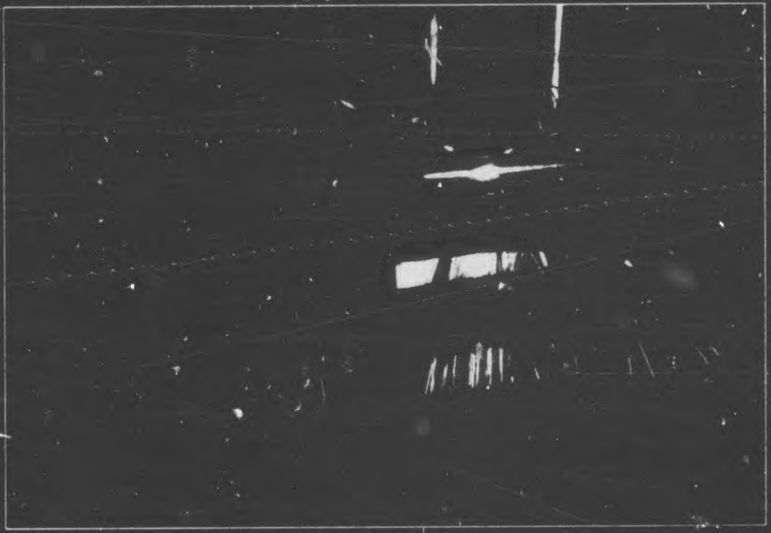

NTF

Industry in Transition

## INSTRUCTOR CHECKLIST

| THE INSTRUCTOR : | Satisfactorily | Needs Improving |
|---|---|---|
| • Cares about apprentices | | |
| • Is tactful | | |
| • Is firm but fair | | |
| • Knows the subject | | |
| • Relates theory and practical applications | | |
| • Uses examples in teaching | | |
| • Determines whether learning occurs | | |
| • Creates interest in learning | | |
| • Listens to ideas and questions | | |
| • Teaches in logical sequence | | |
| • Uses a variety of teaching approaches | | |
| • Demonstrates safe work practices | | |
| • Helps develop self confidence | | |

**NATIONAL TRAINING FUND**
Sheet Metal and Air Conditioning Industry

1900 L Street, N.W., Suite 510
Washington, D.C. 20036

*A Joint Labor Management Program*

Non Profit Organization
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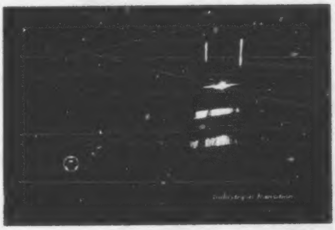

**About the Cover**

The cover of this year's annual report graphically depicts our industry as one that is undergoing change . . . an industry in transition. Increasingly, computerized fitting cutting systems like the one pictured here are being used in sheet metal shops across the country.

This example of high technology on the job illustrates a challenge. The National Training Fund fully intends that the new skills needed in order to operate this new technology in the sheet metal industry will be included in the various curricula. Sheet metal workers across the United States and Canada will be given the advantage of familiarity with this technology.

# Introduction

America, as these words are written, seems to be shaking loose from the recession that has held us in its grip for the past two years. The economic downturn exacted a heavy toll, from businesses and individuals alike. One of the many lessons we have to learn from this dismal experience is that things will never be quite the same, ever again.

We are facing great and dramatic changes in our industrial life. We are striving to cope with [illegible] to understand, to harness the potentials of new technology – automation, robots, lasers, computers, whose capacity seems to escalate at a geometric rate.

Members of the Business Council, comprising executives of some of the country's largest corporations, have pointed to some of the immediate results. For instance, duPont's ability to produce synthetic fibers has doubled in 10 years, but the manpower involved in the process has risen "only four or five percent, because of mechanization and robotics." Another case: Union Pacific Corp., carrying 40% more freight than in 1963 – with about half the number of employees.

You can hear the same story all around the nation's industrial scene. The Sheet Metal and Air Conditioning Industry, which the NTF serves, is certainly not immune to what is happening all around us.

We, too, are an industry in transition.

Our responsibility in this period of fast-moving change is: Be Prepared to Be Ahead! We must realistically face the challenge of adapting our resources and our skills, so that opportunities will expand, contractors will be competitive, and workers will have jobs.

Fortunately, the NTF is an integral part of a constructive relationship – between a group of employers who have demonstrated a progressive ability to adapt quickly to new conditions and new technologies, and a trade union whose leadership is innovative and forward looking. In a period of transition, that relationship is the best guarantee for taking advantage of the new conditions, rather than falling victim to them.

As you will see from this report, the National Training Fund has sought to plan for the future realities in every phase of our activity. A dozen years ago, when the NTF was started, our primary focus was on the training of apprentices. Today, while apprenticeship training is an important aspect of our work, increasing emphasis is placed on helping skilled journeymen upgrade their old skills and acquire new and more sophisticated work capabilities.

That is essential in an industry, once rather static and closely defined, which now is rapidly diversifying. If the laser is to have an important function in our industry, then clearly our skilled craftsmen must be trained in its use. If heavy-gauge metal is required to move air or gases under conditions of extremely high pressure, our craftsmen must be as well trained in its metallurgical properties as they are in those of the more traditional lighter metals. The sheet metal worker for whom welding was once an unknown or a side-line skill, has developed through NTF courses and mobile welding centers into a top-grade welder. Both he and his employer derive direct benefits from the use of these new or expanded skills.

Through these recent years, we have watched with dismay while great American industries sat, rather self-satisfied, on their haunches and let the advantage slip to competitors, domestic and foreign, willing to innovate and experiment.

Fortunately, the sheet metal industry and the union of sheet metal workers have [illegible] very forcefully their unwillingness to sit around and wait for doomsday to happen.

In the best tradition of private initiative and ingenuity, they have demonstrated that this industry is geared to transition, to new ideas, new methods, new technologies – and new markets for our products and our skills.

In that changing scene the National Training Fund is pleased to play an important role.

This report shows how and what we are doing in that effort. And to all of you who work with the NTF and make such a broadscale contribution to our common future, we are most deeply grateful.

W. L. Fillippini

W. L. Fillippini
Administrator

## Welding Advisory Committee

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Union 110
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International Assn.
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Sheet Metal Workers' Local
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Richard Scott
Sheet Metal Workers' Local
Union 170
Los Angeles, California

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Terry Hamous
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Bossier City, Louisiana

Kenneth W. Enscoe
SMACNA of Western
Pennsylvania
Pittsburgh, Pennsylvania

Jerry Edwards
Santa Monica Sheet Metal
Products Industry
Santa Monica, California

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Sheet Metal Workers' Local
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Orrin M. Myler
Sheet Metal Workers' Local
Union 60
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James D. Foster
Sheet Metal Workers' Local
Union 2
Kansas City, Missouri

Harold J. Salinas
Sheet Metal Workers' Local
Union 57
Tampa, Florida

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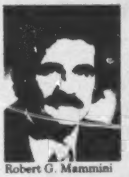
James E. Roth

**Labor**

Lonnie A. Bassett



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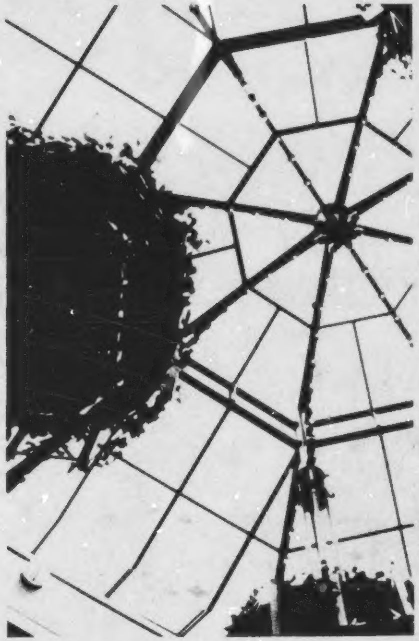
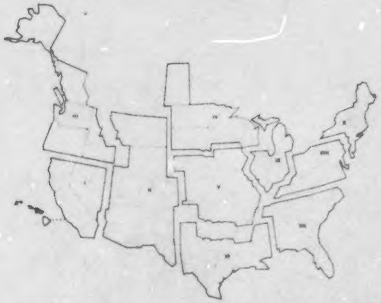




**Regional Coordinators**

I Frank Ulrich

II Harry Garberg

III Jerald W. Judy

IV Thomas W. Day

V George Van Becelaere

VI Cecil Clayton Cook

VII Willie F. Elrod

VIII R. Eugene Hartline

IX John P. Lyons

X Robert G. Schluter

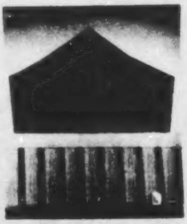
Residential sheet metal is a two-year apprenticeship course of study under development now at the NTF. There are sheet metal workers and contractors who specialize exclusively in residential sheet metal work and this course of study is designed to be responsive to their need.

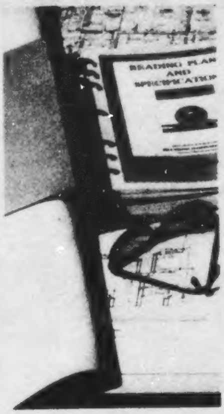
Another area where training is being updated and refined is the "Reading Plans and Specifications" curriculum. The purpose of this course is to teach the sheet metal worker to interpret and use plans and specifications associated with the sheet metal industry.

Walk into any commercial kitchen and you will see a vast array of sheet metal cut and formed especially for this important use. This, too, is an area in which NTF is developing specialized training through the food and beverage curriculum now underway.

And where will tomorrow's sheet metal foremen come from? The Foreman Course of Study currently being developed will provide trained foremen when journeymen complete this coursework. Through this curriculum, sheet metal workers will gain the "people" skills needed to effectively plan, organize, coordinate and motivate those under his or her supervision.

Curriculum Development is a vast and diverse undertaking involving many dedicated individuals, yet it is the beginning step to insure that sheet metal workers will be ready for an industry in transition.





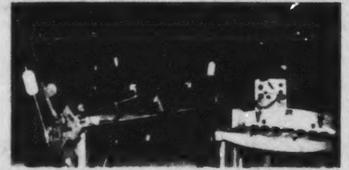
# Apprentice Curriculum

Apprentices in the sheet metal industry today have a lot to look forward to and prepare for. The skills of these young people will help shape the sheet metal jobs of the future. Proper training has never been more critical.

The National Training Fund recognizes the awesome responsibility it has in making certain that apprentices have all the basics. The nationally standardized apprentice curriculum insures both the students and their future employers that they will be provided the best training conceivable . . . wherever they live.

Apprentices have ample opportunity to apply their newly acquired knowledge on the job and to test and refine these skills in the classroom. In addition, each year thousands of apprentices compete at local contests with their respective peer groups.

# Loan/Grants



The loan/grant program has given many JATCs the necessary support to develop and upgrade their training programs and facilities.

It is a program which provides a combination of loans and grants to purchase a wide variety of equipment or to set up training programs.

The loan/grant program began in 1973 with a "seed funding" of $250,000. To date over a million and a half dollars have been provided. Half of this money represents interest-free loans and all the participating JATCs have an outstanding record of repayment.

The loan/grant program is just one more example of the National Training Fund's response to the industry's need for training.

[illegible]

From the contest results, approximately 600 of the best, representing each of the four years, go on to contests at the regional level, and from those competitions, 80 students—the best of the best—travel to Minneapolis to compete at the National Apprentice Contest.

The basis for these demonstrations of skills is the NTF apprentice curriculum. It is a diverse and strenuous course of study. And in these times of transition the curriculum cannot remain status quo. The course work undergoes frequent scrutiny and revisions to meet the needs of the industry . . . to continually improve this basis for craftsmanship.

For the past ten of NTF's twelve years of service, instructor training programs have played an important role in keeping pace with innovation.

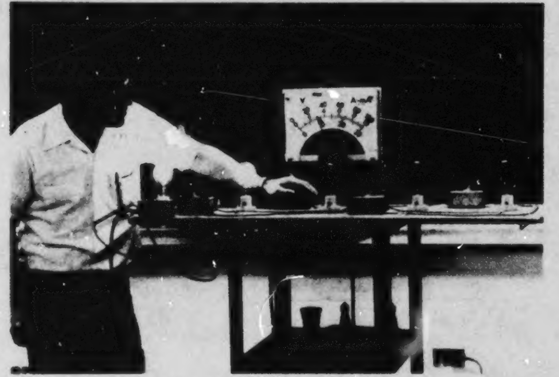
In order to have good training, there must be qualified instructors, and the NTF plays a big part in teaching how to teach.

There have been more than 2,000 participants in the 49 NTF/OSU instructor training programs since 1973.

Other specific instructor training programs include the NTF Welding Instructor Training Program (WITP), the NTF Solar Instructor Training Program and the Testing, Adjusting, and Balancing (TAB) Instructor Training Program.

The newest of these, the NTF solar program, has trained 155 participants. The welding program (WITP) conducted five programs in 1983 with 46 participants. Since its inception, WITP has trained 201 instructors.

And the TAB program added 38 participants this year, bringing the total number to 246 instructors trained to date.



# Energy

It is hard to believe that only ten years ago concerns about energy came into sharp national focus. With the oil embargo of 1973 Americans changed virtually overnight from easy-going energy consumers to cost-conscious energy conservers.

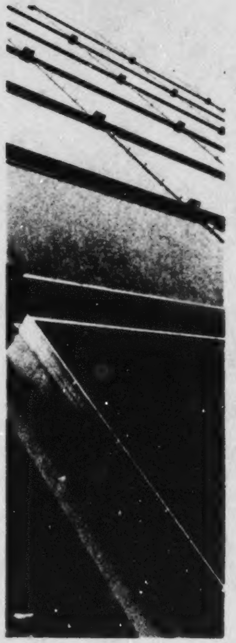
The interest in alternative sources of energy was transferred from alleged "eccentrics" to the public at large. Economy and efficiency became the watch-words of the energy crisis.

Yet as energy suppliers know so well today, the nation's response to a short supply of oil was neither a passing fad nor a "knee jerk" reaction. The continuing popularity of public transportation and car pools can hardly be regarded as a vestige of a by-gone era. Nor can one take lightly the effort and expense invested in homes and businesses to conserve energy.

America has become a nation of "energy waste-watchers," and the trend continues.

For sheet metal workers across the country, this massive change in attitude has resulted in the need for increased sophistication in a number of areas.

In servicing of HVAC systems the emphasis on comfort at the expense of energy savings is gone. Now the sheet metal worker considers the efficiency of the system as well as comfort.



Another example of NTF innovation is the Verification of Visual Inspection Program (VVIP). Started in January as a pilot project, VVIP is designed to prove the accuracy of visual inspection of sheet metal welds as provided in the AWS D9.1-80 document.

NTF's welding instructors as well as five local JATC instructors have joined in the project, which involves the welding and inspecting of over 900 sheet metal specimens. The results of these inspections will then be verified by the renowned Battelle-Columbus Laboratories.

When complete, VVIP is expected to generate greater respect for visual examination of welds on sheet metal and greatly enhance the use and acceptance of AWS D9.1-80. This will allow the sheet metal contractor to avoid the unnecessary expense of destructive testing.

None of these specialties nor the changes in the application of the more traditonal sheet metal skills could have been possible without training.

The NTF is proud to have introduced training programs that are in and of themselves, innovations in the energy field.

TAB, a now-classic sheet metal skill, has changed over the years to fill new job needs. It is a skill introduced in recent years at the apprentice level – taught at an instructor level course, and incorporated heavily into both the service curriculum and energy management programs. Excitement might well be the byword and NTF is there . . . in the midst of it all.

NTF does so by conducting both Basic and Advanced Instructor Training Courses in Testing, Adjusting, and Balancing. These courses prepare local JATC instructors to teach the proper methods and techniques for ascertaining and maximizing the capabilities of environmental systems.

The move toward energy awareness has also expanded another area of sheet metal skills . . . the maintenance and repair of HVAC systems. The service curriculum covers the importance of determining that a system is working according to design and specifications, and provides the sheet metal worker the skills to do this essential task.

When the public interest in energy grew to include solar power, the NTF acted quickly to insure that when people think of installing solar systems, they will turn to the sheet metal industry.

To date, NTF has conducted nine Solar Instructor Training Programs for sheet metal instructors across the country. The solar curriculum covers all aspects of solar system installation and the role that solar systems play in energy conservation.

The NTF has also taken the lead in another important facet of saving energy – energy management. Through a joint labor-management National Energy Management Institute (NEMI), in which NTF is deeply involved in the training aspects, a basic energy management "pilot" course has been developed. It trains sheet metal workers to become energy management technicians who work with contractors and engineers in assessing a building's energy system and who recommend the installation and maintenance of cost-efficient systems. The formalized curriculum for energy management training is being released this fall, and its incorporation into the NTF program promises to provide even more jobs in the energy field for sheet metal workers.

National Energy Management Institute • NEMI • In association with SMACNA SMWIA & NTF

# Welding Instruction

[illegible]

In recent years the field of sheet metal welding has exploded with new possibilities. Where once a sheet metal worker with welding experience was a rarity, today thousands of apprentices and seasoned journeymen are adding welding to their battery of skills. And the National Training Fund helped make it happen.

A changing industry called for new instruction techniques so the NTF responded with a fleet of "classrooms on wheels" taking the latest welding instruction methods wherever and whenever they were needed. Two new mobile welding trailers were completed this year. This brings the total to five units in the growing NTF fleet.

The trailers have literally changed the face of sheet metal welding instruction. Now, welders are prepared for certification on location so they can qualify for a specific job. At the same time, experienced welders are sharpening existing skills, and journeymen and apprentices who never learned welding are acquiring this new skill, making them more competitive than ever.

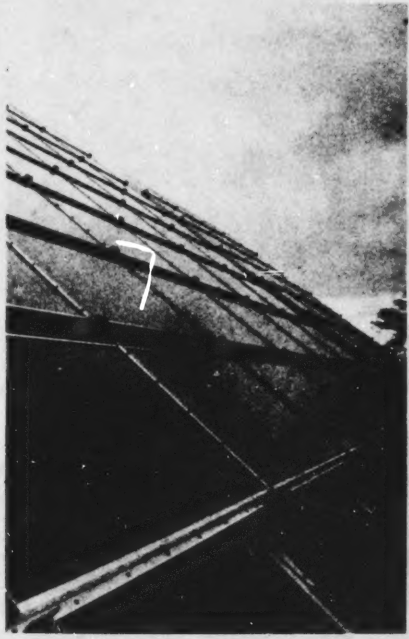
The trailers are outfitted with state-of-the-art equipment, including SMAW, GMAW and GTAW units. As of June 1983, 236 sheet metal workers have qualified for various types of welder certifications.

The NTF welding curriculum emphasizes both practical experience as well as welding theory. In the classroom, apprentices learn the physical properties of the various metals during the welding process. Coupled with many hours of "hands-on" experience, this instruction results in a well-rounded sheet metal craftsman.

The foundation for NTF's promotion of welding has always been its ever-expanding library of instruction manuals and audiovisual aids. Particularly popular has been the NTF Welding Manual which has had wide circulation throughout the industry.

At the moment NTF is revolutionizing its audiovisual library by transferring the entire stock of welding films onto new videodiscs. In this fast-changing world of instruction the software can be as important as the quality of instruction, and with this new technology JATCs will enjoy a degree of flexibility never before possible.

As sheet metal work evolves and new welding processes are introduced, leaders in the industry are looking to the NTF for help in establishing guidelines. When the American Welding Society was developing its Specifications for Welding of Sheet Metal, they turned to the NTF for the technical know-how and experience needed in establishing these all important standards. The AWS D9.1-80 Specification, which covers the welding of thin gauge metal, was the result of this cooperative effort. It is now a "best seller" among AWS technical standards.



Testing, adjusting and balancing (TAB) of environmental systems are more important than ever before, and retrofitting of systems considered "energy wasters" is far more common these days.

School administrators, plant operations managers and business executives now take energy costs and system efficiency into account in preparation of their annual budgets and their plans for the future.

Here, too, the sheet metal industry plays an important role. It is a transition wherein sheet metal contractors, engineers and sheet metal workers are becoming energy experts. Together they work to inspect a building for its energy soundness from top to bottom, make recommendations and give estimates of energy. Not only do they work at saving energy, but also the consumers' dollars.

And the interest in and demand for active solar systems has become yet another specialty for sheet metal workers.

# Instructor Training

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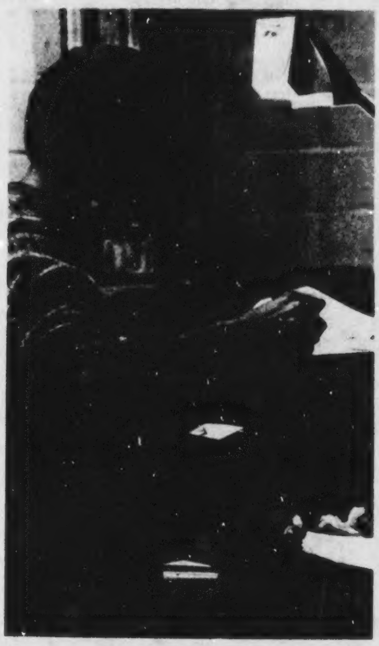


Patrick
Redder

# Promotion

NTF promotes the sheet metal industry and its training programs throughout the country. At trade shows, high school career days, trade events specifically planned to attract women and minorities, NTF is there to introduce people to this exciting industry and talk about training opportunities for both apprentices and journeymen.

In addition NTF distributes publications such as the NTF Newsletter, the Annual Report, and specialized brochures to update readers on the activities within the industry.

And as part of this industry-wide program, NTF participates in the annual AFL-CIO Union-Industries Show. Each year this event is held in a major metropolitan area and attracts 200,000 or more people.

# Safety

**T**ime was when the only protection a sheet metal worker had was hard-earned callouses on his hands.

Today, that's all changed. With the variety of equipment and situations of sheet metal work, safety has become an important watch-word.

NTF teaches safety in both apprentice and journeyman curricula. And in NTF films and publications, safety is emphasized again and again.

Literally hundreds of thousands of copies of the publication "Construction and Shop Safety Orders" are in the hands of sheet metal workers and contractors.

And "Procedures for Emergency Care," a quick reference flip chart on safety issues, also meets with high demand throughout the industry.

Within the last two years, a column entitled "Safety Corner" has become a regular feature of the NTF Newsletter.

# Training Aids

Over the past 12 years, the National Training Fund has employed a variety of training aids. Audiovisual aids, in particular have gone through a vast change ... from chalk boards to videodiscs.

During 1983, the NTF has been exchanging the videotape technology for videodisc hardware and software. The videodisc can store up to 54,000 frames of information and any one of the frames can be "rapid-searched" and frozen so that students can examine the details more closely. This feature of the videodisc provides amazing versatility for both instructor and student. All of the NTF training films are being transferred to videodisc, so now JATCs have their choice of the videodisc or 16mm film.

While the new technology is a great aid in teaching, the NTF by no means abandoned the classic tools of educating ... manuals, overhead projectors, slides, etc. All of these aids have an appropriate use in the classroom. And as a number of studies reveal, the importance of visual aids in education cannot be overlooked. It is estimated that 80 percent of what we learn is through seeing.

The emphasis on visual aids coupled with "learning by doing" helps make NTF instruction among the best in the country.

# Staff

NTF Administrator W. L. Fillippini stands behind (left to right) David E. Herrington, Administrative Assistant for Technology and Educational Programs, Jerry Olejniczak, Executive Assistant to the Administrator and Robert D. Martinez, Administrative Assistant for Training.

It takes a dedicated staff to carry out the demanding work of the NTF.

The staff at the national office, the regional coordinators and the mobile welding instructors all must keep abreast of the changes to improve industry training.

In Washington the tasks include administrative functions as well as important research and program development. In the field the regional coordinators must be effective in communicating NTF goals to labor and management, school and government officials, and the public in general.

And the newest addition to the NTF, the mobile welding instructors invest long hours certifying welders in remote areas.

Though the tasks are varied, they all work toward improved skills and increased job opportunities in the sheet metal industry.

## *Welding Instructors*

Darvell Beard

Joseph Lovey Sr.

Jerry Miller

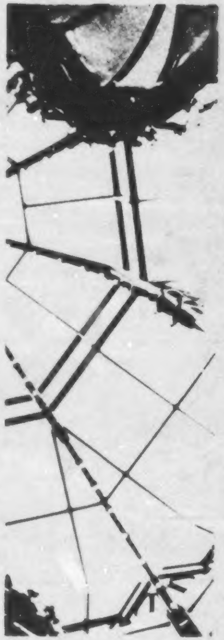
Rupert Walworth

Terry Bush

John Wasnik

Robert Stanley

# Curriculum Development



As the sheet metal industry changes, so do the kinds and variety of jobs.

The National Training Fund responds to the industry transition by providing training for new and varied skills. It follows that curriculum development is a continuing task of the NTF. Through this ongoing work, NTF is working toward the common goal of preparing even more highly skilled sheet metal craftsmen, and thus, ultimately, more jobs for sheet metal workers.

The new curricula currently underway are as diverse as the industry itself: architectural sheet metal, production, residential sheet metal, plan and specification reading, food and beverage, and foreman training.

The demand for architectural sheet metal is an example of transition in the industry, though in this case the change is a return to the old, rather than an introduction to new technology. It requires the revival of skills, some of which were all but forgotten. But more and more, people are returning to an appreciation for the craft. And as more and more emphasis is placed on retrofitting older homes and buildings, the need for skilled architectural sheet metal workers increases.

# Committees

### Advanced Study Committee

Robert G. Bird
Sheet Metal Workers' JATC
Los Angeles, California

William DeYoung
Wheeler-Blaney Company
Kalamazoo, Michigan

Norman L. Griffith
McMinnville, Oregon

Richard Gatewood
Sheet Metal Workers' JATC
Dallas/Fort Worth, Texas

Peter F. Lyszewski
Sheet Metal Workers' Local
Union 71
Buffalo, New York

Robert Ryan
Sheet Metal Workers' JATC
Albuquerque, New Mexico

Richard Hejza
Sheet Metal Workers' Local
Union 73
Chicago, Illinois

Richard Newlon
Sheet Metal Workers' JATC
Columbus, Ohio

### NTF Advisory Committee for Foreman Course of Study

**Management**

Kurt Wittler
Wittler-Young Company, Inc.
Los Angeles, California

Michael Dobrowolski
Central Sheet Metal, Inc.
San Antonio, Texas

**Labor**

Ralph W. Taylor
Sheet Metal Workers' Local
Union 224
Dayton, Ohio

Archie Dorn
Sheet Metal Workers' Local
Union 296
Regina, Saskatchewan,
Canada

### Residential Course of Study Advisory Committee

**Management**

George "Butch" Welsch
Welsch Furnace Company
St. Louis, Missouri

Gary L. Davis
Evergreen State Sheet
Metal, Inc.
Everett, Washington

**Labor**

James D. Foster
Sheet Metal Workers' Local
Union 2
Kansas City, Missouri

Edward Farrell
Sheet Metal Workers' Local
Union 65
Cleveland, Ohio

### Architectural Sheet Metal Advisory Committee

**Management**

Clovis Hendry, Sr.
Clovis Hendry, Inc.
Baton Rouge, Louisiana

William Kolthoff
Architectural Sheet Metal Corp.
Oakland, California

**Labor**

Michael Sullivan
Sheet Metal Workers' Local
Union 41
Indianapolis, Indiana

### Energy Management Advisory Committee

Daniel J. Driscoll
Peabody & Wind
Engineering Co.
Philadelphia, Pennsylvania

Robert Segal
A. J. Segal & Sons
Farmington, Michigan

Lester Lang
Lackland Sheet Metal Co.
St. Louis, Missouri

David Bevirt
SMACNA
Tysons Corner
Vienna, Virginia

Lawrence J. Cassidy
SMWIA
Washington, D.C.

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## Financial Statement

### *Statement of Assets, Liabilities and Fund Balance*

December 31, 1982 and 1981

| **Assets** | 1982 | 1981 |
|---|---|---|
| Cash | $ 304,157 | $ 176,007 |
| Investments in certificates of deposit and short-term commercial paper, at cost, which approximates market | 3,792,186 | 4,182,000 |
| Accrued interest receivable | 15,152 | 10,381 |
| Due from the Solar Training Institute | 42,038 | 34,991 |
| Due from the National Energy Management Institute | 25,000 | |
| Loans to Joint Apprenticeship Committees | 234,676 | 229,205 |
| Inventory of books and educational materials | 1,236,101 | 753,637 |
| Training films and curriculum programs (at cost, less accumulated amortization of $2,345,637 and $1,970,101) | 1,515,858 | 1,390,000 |
| Property and equipment (at cost, less accumulated depreciation of $515,365 and $320,809) | 1,114,646 | 763,610 |
| Prepaid expenses and other assets | 71,351 | 20,008 |
| | $8,351,165 | $7,559,839 |
| **Liabilities and Fund Balance** | | |
| Accounts payable | $ 122,138 | $ 175,527 |
| Deferred compensation | 47,682 | 28,083 |
| Payroll taxes payable | 5,903 | 5,432 |
| | 175,723 | 209,042 |
| Fund balance | 8,175,442 | 7,350,797 |
| | $8,351,165 | $7,559,839 |

### *Statement of Revenue, Expenses and Changes in Fund Balance*

December 31, 1982 and 1981

| **Revenue** | 1982 | 1981 |
|---|---|---|
| Employer contributions | $4,498,514 | $4,826,126 |
| Interest income | 553,099 | 497,492 |
| Reimbursements from the Solar Training Institute | | 39,632 |
| Equipment Rentals – National Energy Management Institute | 64,952 | |
| Other income | 5,219 | 5,206 |
| Total revenue | 5,121,784 | 5,368,456 |
| **Expenses** | | |
| Administrative | 1,801,548 | 1,690,864 |
| Training programs | 1,151,600 | 1,085,948 |
| National Apprentice Contest | 277,402 | 240,502 |
| Audiovisual programs | 253,003 | 211,048 |
| Grants to Joint Apprenticeship Committees | 96,496 | 73,370 |
| Books and publications distributed | 293,173 | 355,671 |
| National Energy Management Institute | 423,918 | 125,778 |
| Total expenses | 4,297,139 | 3,783,181 |
| Excess of revenue over expenses | 824,645 | 1,585,275 |
| Fund balance, beginning of year | 7,350,797 | 5,765,522 |
| Fund balance, end of year | $8,175,442 | $7,350,797 |

## PREPARED STATEMENT OF A. YVONNE PRICE, CHAIRPERSON, D.C. APPRENTICESHIP COUNCIL, WASHINGTON, D.C.

Mr. Chairperson and members of the committee, I am A. Yvonne Price, chairperson of the D.C. Apprenticeship Council. I appreciate the opportunity to submit this testimony to you on the apprenticeship system, related to your oversight hearing on the National Apprenticeship Act. The D.C. Apprenticeship Council was established by Congress on May 21, 1946 and takes seriously its responsibility to refine, enhance and expand apprenticeship for our residents. We have been gratified to have the direction of Mayor Marion Barry, Jr., to expand and promote the apprenticeship system.

We view apprenticeship as the most systematic method of training, with the added advantage of involvement of the public, private and labor sectors of our community. The passage of the National Apprenticeship Act in 1937 gave protection to a time honored system which has been efficient and cost effective in this country and abroad. The production of excellent craftspersons across the world is proof of the success of this method. We have produced persons who are self-sufficient, proud of their trades and are contributing members of communities. There is strong evidence that the combination of on-the-job training and related classroom instruction develops a worker with finished skills and the ability and motivation to absorb new technology as it appears.

This country has not taken advantage of the opportunity to foster and develop apprenticeship programs in the over 700 apprenticeable trades.

The cost to Government is minimal. Private sector program sponsors pay wages, school tuition and other costs. The public sector's approval of apprenticeship can be identified by their willingness to comply with apprenticeship laws. They are convinced that the system is valuable, but unfortunately the message has not been widely disseminated.

Government is only responsible for providing staff support, administration, supervision and credentialing of apprenticeship. From a taxpayers point of view, apprenticeship training is the most cost-effective manpower development program operating in the Nation today.

Apprenticeship, in spite of the advantages, is largely unrecognized and is fragmented administratively by the Federal Bureau of Apprenticeship and Training and State Apprenticeship Councils. Your committee, by looking into this area, can begin to promote efforts to eradicate the misunderstanding of the system.

There have been no changes in the Federal statute on apprenticeship training for many years. The result is that employment and training legislation fails to incorporate apprenticeship training as an essential component of national, State and local planning and programmatic activity. We have been fortunate in the District of Columbia to have local governmental support which has opened doors to our residents and enhanced our work force.

We make the following recommendations which we believe would assist in clarifying any misconceptions:

### (1) A RELIABLE APPRENTICESHIP DATA SYSTEM IS NEEDED

We need to focus on the quantity and quality of apprenticeship training being taught, conducted by States, occupation and industry through a Federal data system developed by the U.S. Department of Labor. This will enhance knowledge which is reflected in the planning process and will identify growth occupations, such as the high technology industries.

### (2) A NATIONAL POLICY ON THE PLACE OF APPRENTICESHIP TRAINING IN EMPLOYMENT AND TRAINING PROGRAMS SHOULD BE ADOPTED BY CONGRESS

There is a lack of national identification of apprenticeship training as a priority method among employment and training programs. There should be a national linkage developed with other employment and education programs which priorities the apprenticeship system.

### (3) CONGRESS NEEDS TO FURTHER CLARIFY IN A NATIONAL POLICY THE ROLES OF FEDERAL AND STATE APPRENTICESHIP REPRESENTATIVES

Funds, both State and Federal, are scarce. Day to day operations of apprenticeship programs are most effectively administered by States and should remain with them. The U.S. Department of Labor, Bureau of Apprenticeship and Training, should be creative in promoting apprenticeship, giving technical assistance to States and insuring their compliance with Federal law, and in assuming an advocacy role in the planning of other employment and training programs.

### (4) DEVELOPMENT OF UPDATED RELATED INSTRUCTION CURRICULA BY FEDERAL AND STATE EDUCATIONAL AGENCIES WHICH IS MADE AVAILABLE FEDERALLY AND STATEWIDE

The D.C. Apprenticeship Council and the D.C. public schools have joined together to develop a D.C. School of Apprenticeship, under the D.C. public schools, which will open in February, 1984. Both the Council and the public schools will continue to work together to have the most modern and effective curricula which can be developed.

The D.C. Apprenticeship Council is carrying out its responsibility to expand and promote apprenticeship by working in neighborhoods to educate residents and private sector employers to the value of apprenticeship. Federal activity on a national level is needed in this area to insure that all citizens have an equal opportunity to participate in apprenticeship programs. Outreach to females is of particular importance.

The D.C. Apprenticeship Council believes in the apprenticeship training system as a cost-effective method of great value in enhancing the lives of citizens, contributing to the growth of communities, and enhancing the formula of public, private and labor sector cooperation.

I appreciate the opportunity to contribute the views of the D.C. Apprenticeship Council to you. The Council commends the committee for its focus on this vital, priority area.